R2D2

Dust Collector

Instruction manual (USA)

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1. Introduction

CONTEC® would like to thank you for deciding to purchase the R2D2 dust collector.

The R2D2 has been specially developed for connection to floor preparation machinery such as mobile blast machines, concrete planers and floor grinders to enable a dust free operation. Even huge quantities of dust can be handled by the R2D2. This means the R2D2 is suitable for use with high performance machinery. In the CONTEC® product range, the R2D2 is specially used for the MODUL 350 and ELGATOR mobile shotblasters and the OMEGA 700 floor grinder. The R2D2 can be adapted for a wide range of applications not only limited to the construction industry.

In the following pages, you will find all the necessary information, to achieve a safe, reliable and highly competent performance from the R2D2. It is therefore important to follow the strict guidelines for the deployment and servicing of the R2D2 in order to obtain optimum performance.

It is in the interest of all persons operating or using the machine, to take note of the operating instructions in this manual in order to be fully conversant with the components and functions of the R2D2 dust collector.

2 Machine applications

Collecting of dry dust produced by CONTEC® Surface Preparation Machines. The use of the machine outside is only possible in dry weather.

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Declaration of Conformity according to EN ISO/IEC 17050-1

EC-Declaration of Conformity

Month.Year: .

For the machine described below

Product denomination:	Dust Collector
Model:	R2D2
Serial number:	

Herewith we declare, that the machine is complying with all the essential requirements of the

Machine Directive 2006/42/EC of the EUROPEAN PARLIAMENT of the 17th of Mai 2006

The person authorized to compile the relevant technical documentation (According to Appendix II Nr. 1. A. Nr. 2, 2006/42/EG):

Name, Surname:	Greb, Johannes
Function:	Technical Manager
Address:	Neuer Weg 17, 57518 Alsdorf, Germany

More information on the compliance with the directive is contained in **Appendix 1.**

This Declaration is given by the manufacturer:

Name:	Contec® Maschinenbau & Entwicklungstechnik GmbH
Address:	Hauptstraße 146, 57518 Alsdorf, Deutschland / Germany

Given by:

Name, Surname:	Greb, Johannes
Function:	Technical Manager

Alsdorf, 22.12.2010

Place/Date Signature

Appendix 1 of the Declaration of Conformity

Month.Year: .

For the machine described below

Product denomination:	Dust Collector
Model:	R2D2

Herewith we declare, that the machine is complying with all the essential requirements of the:

Directive 2004/108/EC of the EUROPEAN PARLIAMENT of the 15th of December 2004 on Electromagnetic Compatibility
Directive 2006/42/EC of the EUROPEAN PARLIAMENT of the 17th of Mai 2006

Harmonised Standards used:

EN 12100 - 1 „Safety of Machinery – Basic concepts“
EN 12100 - 2 „Safety of Machinery – Technical principles”

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4. Description

Picture 1 R2D2 Power unit 	Picture 2 R2D2 Filter unit container version
Picture 3 R2D2 Filter unit bag version 	Picture 4 Compressor
Picture 5 Water separator 	Picture 6 Dust ports: Left 70 mm - Right 125 mm

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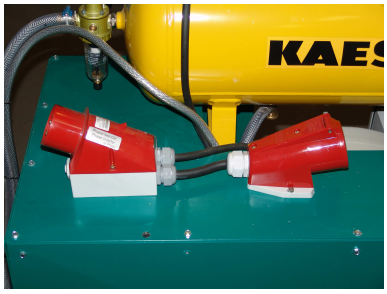
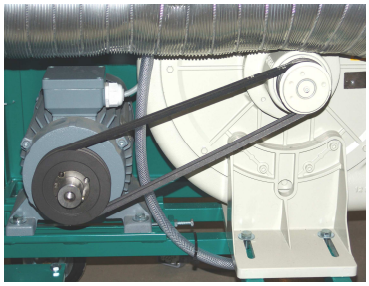
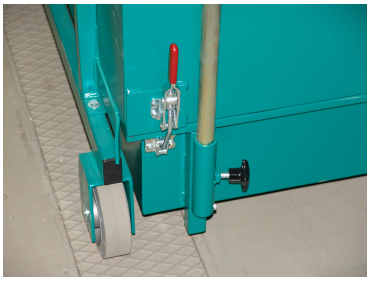
Picture 7 Dust bin bag version 	Picture 8 Dust bin container version
Picture 9 Dust bin lifting device 	Picture 10 Phase inverter
Picture 11 Plug and socket 	Picture 12 Belt drive 
Picture 13 Electric and air pressure ports 	Picture 14 Clamp for dust bin 

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5. Safety

Attention ! The R2D2 dust collector is constructed according to existing safety rules and regulations. These technical precautions should not be removed or changed under any circumstances. While operating the machine the following points should also be kept in mind:

1. Disconnect the machine before commencing any servicing or maintenance work - however menial. Never unplug the machine while it is still running. This notice can be found in every manual but in nearly every part of the R2D2 high electrical currents are transmitted. The danger of injury is therefore not only from electric shock, but also from moving parts of the machine.

2. Never wear loose or badly fitting clothing. Flapping sleeves may be pulled into the machine causing serious injury.

3. All rotating parts of the machine are suitably protected by covers, which prevent clothes or similar from entering the machine. Under no circumstances should these covers be removed before the machine is switched on.

4. The R2D2 should be switched off immediately if any unusual noises or vibrations are detected whilst the machinery is in operation. A thorough check must be carried out in order to detect the cause.

5. Before leaving the R2D2 the operator must switch off the machine and make sure that it cannot accidentally roll from it's position. Also disconnect the machine from the mains.

6. Check the power cables regularly as damage may have occurred while operating the machine. Always disconnect the cables before examination and treat all electrical parts with extreme care.

7. Always re-connect all the safety plates and covers after any maintenance work.

8. If the noise of the R2D2 exceeds 90 dB(A) ear protections have to be worn by the operator.

9. The compressor on the power unit is heating up during operation. Don’t touch any part of the compressor. **Danger of burning yourself !**

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6. Operation

Important: Before attempting to operate the R2D2 ensure that you are fully familiar with all the controls and the safety regulations of this manual !

Connect the R2D2 dust collector via the dust hose to the application, for example shotblaster, floor grinder or floor planer. Make sure that the dust hose is in good condition and without any tears or other defects. Little holes can dramatically reduce the performance of the dust collector.

Check the electric cables.

Connect the extension lead to the mains and to the socket on the power unit (picture 11). You need a 460 V, 3 phase power supply.

It is possible to make one unit out of the power and filter unit. On one side of the filter unit are two clamps in rectangular pipes. Pull them out and turn them 90°. Slide the end of the clamps inside two holes on the side of the power unit. Now the two units are one machine which can be moved as one on site.

Connect the 150 mm (diameter) hose from the power unit to the filter unit. Connect the air pressure hose and the electric connection of the power unit to the filter unit.

Press the „START“ button on the control panel. If the indicator light on it’s right side doesn’t stay on when you release your finger, then the motor wants to start in the wrong direction. In this case disconnect the plug (picture 10) on the power unit. The plug is a reverse plug which means that two phases can be swopped by inserting a screw driver in between the pins and twisting them round to the opposite direction. This allows the motor to run in the correct direction. When there is no pressure in the air tank, the compressor starts to work.

Turn the star-delta switch in the „star“ position. The motor begins to turn. Wait approximately 10 seconds before you turn the switch into the „delta” position. **It is important to wait long enough before you switch over from the “star” to the “delta” position.** Wait until the motor is not increasing the speed any more before you switch over. You can now start to work.

The dust bin of the R2D2 has to be emptied during operation. How often depends on the amount of dust produced during the application.

Only dry dust or dry material can be removed by the R2D2. Wet or greasy dust blocks or in the worst case destroys the filter cartridges.

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6.1 Variations of the dust collection

Basically there are two methods of collecting the dust with the R2D2. The first one simply fills the dust container (picture 8) with dust which can then be emptied. The second method fills a bag within a bin (picture 7). When the bag is full it can be sealed with a string and then disposed of into a container. Method one reduces waste in the form of plastic bags, method two reduces the possibility of problematic dust escaping into the air.

6.1.1. Operation with the container version

Switch the R2D2 "On" (see chapter 5 Operation"). The dust container (picture 8) is located underneath the filter cartridges. During operation the dust container will fill up. For emptying the container switch the R2D2 "Off". There are for clamps (picture 14) which keep the container underneath the filter unit. Open the clamps and the container will be lowered down to the floor. There are two handles on the container which allows you to use the container as a wheel barrow. Empty the container. Fix the now empty container using the steps shown above in reverse order.

6.1.2. Operation with the bag version

Remove the bins from the R2D2 dust collector. Place the bag in the dust bin as you would with a normal dust bin. The opening of the bag must be pulled around the opening of the bin. Lift the bin with the handle. Connect the vacuum hose. The dust bag will be sucked to the inner side of the dust bin. This opens the bag and it can be filled with the dust.

Attention ! The vacuum hose must be connected correctly when operating with a dust bag. If not properly connected the bag will be sucked into the machine.

Open the dust valves. The bag will now be filled during operation. When the bag is full remove the vacuum hose. The bag will now close around the dust like a "bottle neck". Close the dust valves. Lower the bins to the floor by raising the lift handles. If necessary the "bottle neck" of the bag can be sealed with string. This minimises the possibility of dust escaping into the air. Pull the bins out of the machine and remove the dust bags. Take new bags and start from the beginning.

Attention ! When the dust bin is removed from the R2D2 and no dust should escape from the machine, the dust valve must be closed (lever horizontal) and the ventilator left running. The dust valve is not 100% airtight but because the ventilator runs continuously, air is also sucked continuously inside the dust collector. This prevents dust escaping out of the valve.

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7. Maintenance

7.1 Belt drive

The belt drive (picture 12) has to be tensioned periodically. Loosen the four screws which fix the motor to two rails. Only loosen the screws, don't remove them. Picture 12 shows a screw in between the ventilator and the motor below the belts. Loosen the nut and turn the screw clockwise until the belt has the correct tension. The belt shouldn't move more than one centimetre half way in between the pulleys. Before tightening the motor foot screws check if the two pulleys of the motor and ventilator are still in line. If they are not in line change the position of the motor on the rails until the right position is found.

7.2 Compressor

The oil level of the compressor has to be checked and the water inside the tank has to be emptied regularly. All necessary information is given in the compressor manual in the appendix.

7.3 Water separator

Picture 5 shows the water separator of the R2D2. The water separator separates the water from the compressed air and makes sure that no water will be pressed inside the filter cartridges. The separator has to be checked on a regular basis and the tank has to be emptied when full. The speed with which the tank fills with water depends on the moisture of your location. To empty the tank, open the valve on the bottom side of the separator.

7.4 Filter cartridges

If the performance of the R2D2 is not sufficient any more or if the filtration is no longer dust free the filter cartridges have to be checked.

Before you start, the dust collector should be switched on for a while without sucking dust. The pulse jet cleaning mechanism then removes most of the dust on and around the cartridges. Remove the dust bin (picture 7 to 9). If you have a bag version, the conical part of the machine frame (picture 3) has to be unscrewed.
By loosening the wing screws underneath the cartridges they can be pulled out of the machine. Use air pressure to clean the filters and check them for any damage. If necessary one or all the cartridges have to be replaced.

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8. Technical data

8.1 Power unit

Height in cm	148 (58 in)
Length in cm	101 (40 in)
Width in cm	51 (20 in)
Weight in kg	160 (353 Ibs)
Electrical connection	460 V, 60 Hz, 3 Phase, 10.2 A
Max. airflow in m^3/min	38 (1.342 cu ft/min)
Max. vacuum	10150 Pa (101.5 mbar)
Filter cleaning system	Pulse jet
Noise level L_{wa} *	83 dB(A)
Noise level Leq *	71 dB(A)

* Data: VÜA Verein zur Überwachung technischer Anlagen e.V.

8.2 Filter unit container version

Height in cm	120 (47 in)
Length in cm	105 (41 in)
Width in cm	79 (31 in)
Weight in kg	120 (265 Ibs)
Filter area in m^3	10 (107 sq ft)
Number of filter cartridges	5
Dust ports in mm	70 / 125 (2.76 / 4.92 in)
Volume of dust bin in l	90 (24 gal) standard / 160 (42 gal) optional

8.3 Filter unit bag version

Height in cm	165 (65 in)
Length in cm	105 (41 in)
Width in cm	79 (31 in)
Weight in kg	160 (353 Ibs)
Filter area in m^3	10 (107 sq ft)
Number of filter cartridges	5
Dust ports in mm	70 / 125 (2.76 / 4.92 in)
Volume of dust bin in l	2 x 75 (19.8 gal)

Technical data subject to change

9. Appendix

Diagrams
Wire diagram
Part list
Manual Compressor

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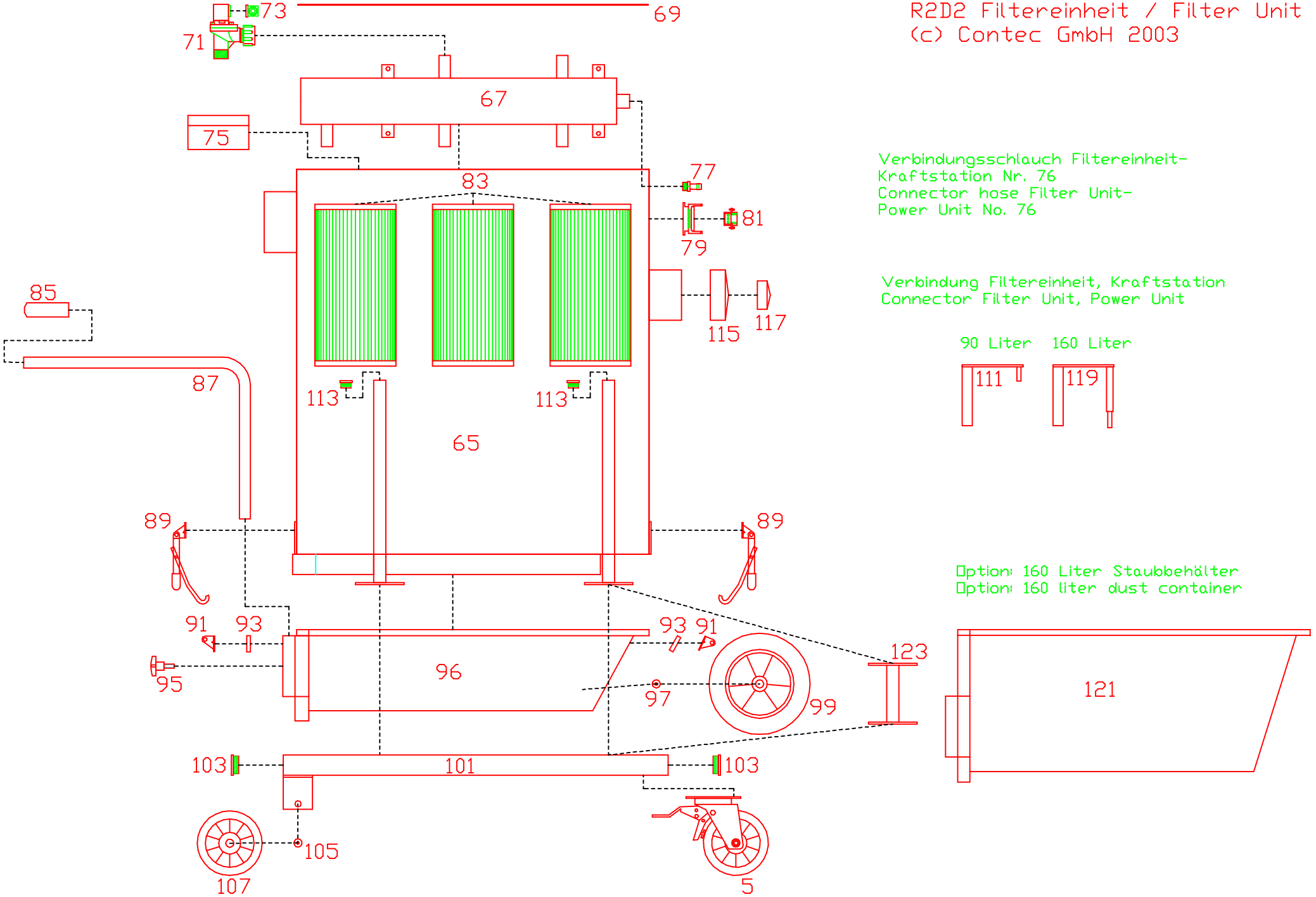
R2D2 Filtereinheit / Filter Unit

(c) Contec GmbH 2003

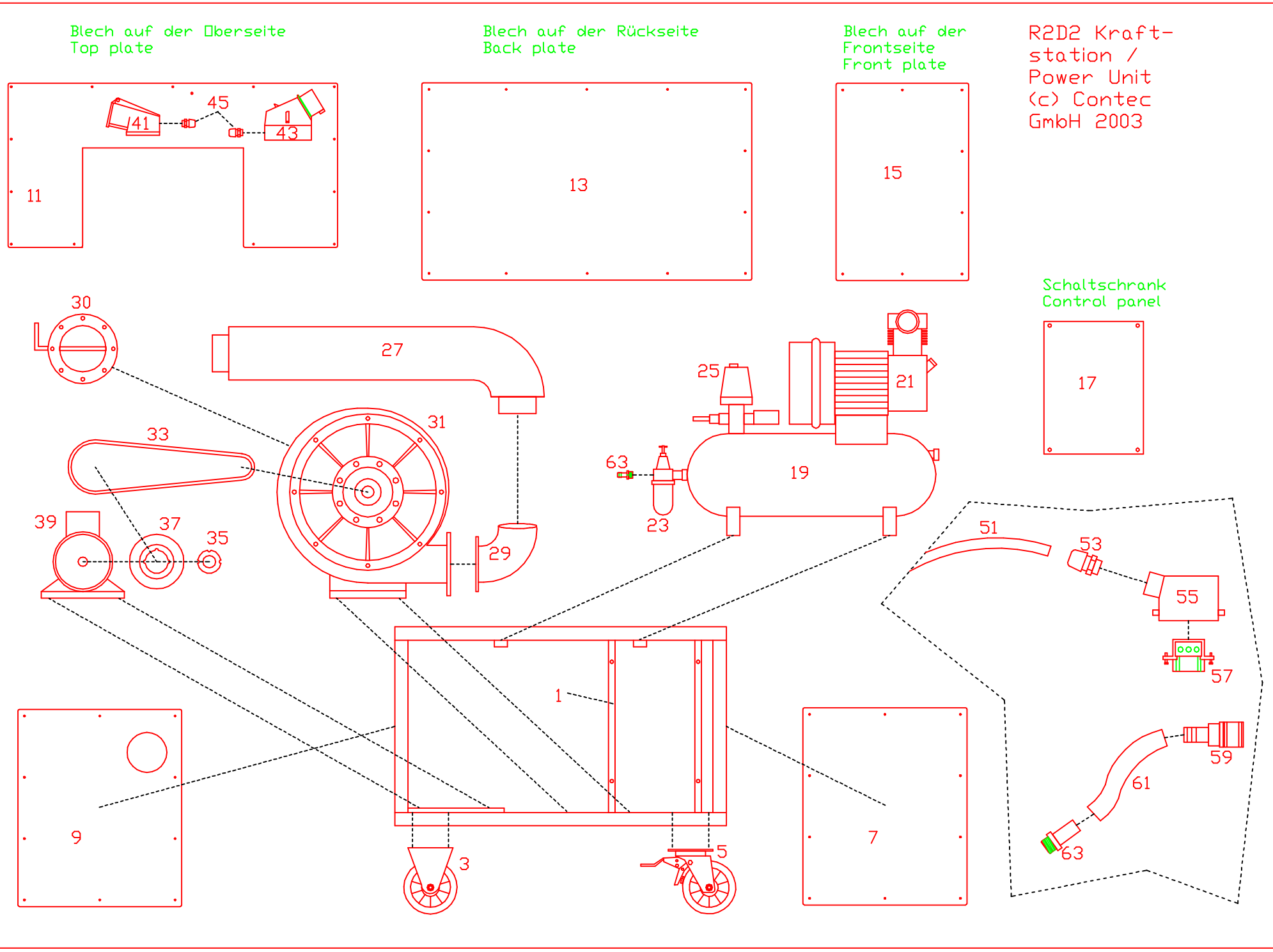


Verbindungsschlauch Filtereinheit-
Kraftstation Nr. 76
Connector hose Filter Unit-
Power Unit No. 76

Verbindung Filtereinheit, Kraftstation
Connector Filter Unit, Power Unit

90 Liter 160 Liter

Option: 160 Liter Staubbehälter
Option: 160 liter dust container


Blech auf der Oberseite
Top plate
Blech auf der Rückseite
Back plate
Blech auf der Frontseite
Front plate
R2D2 Kraft-station / Power Unit (c) Contec GmbH 2003
Schaltschrank
Control panel
11
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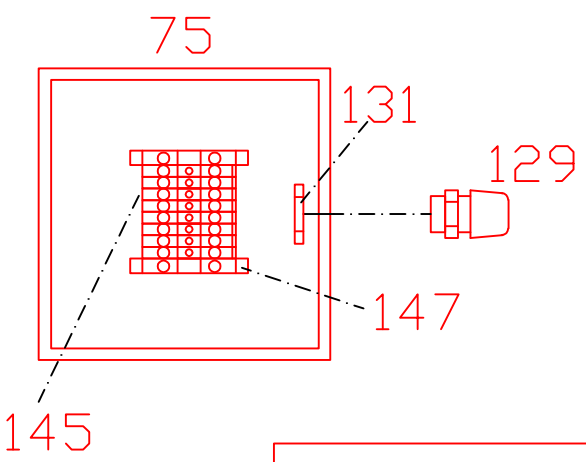
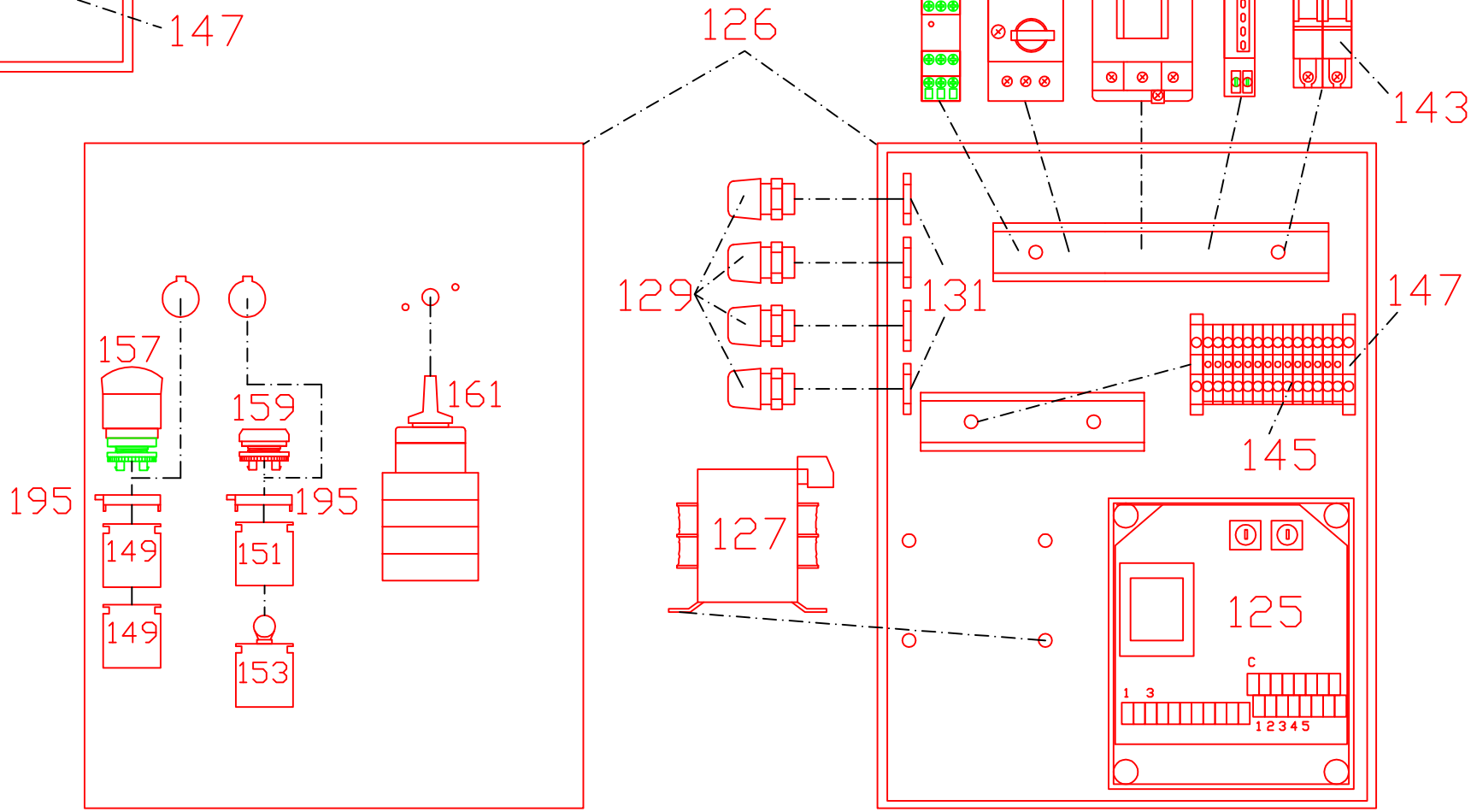
3
5
63

R2D2 Schaltschrank / Control Panel

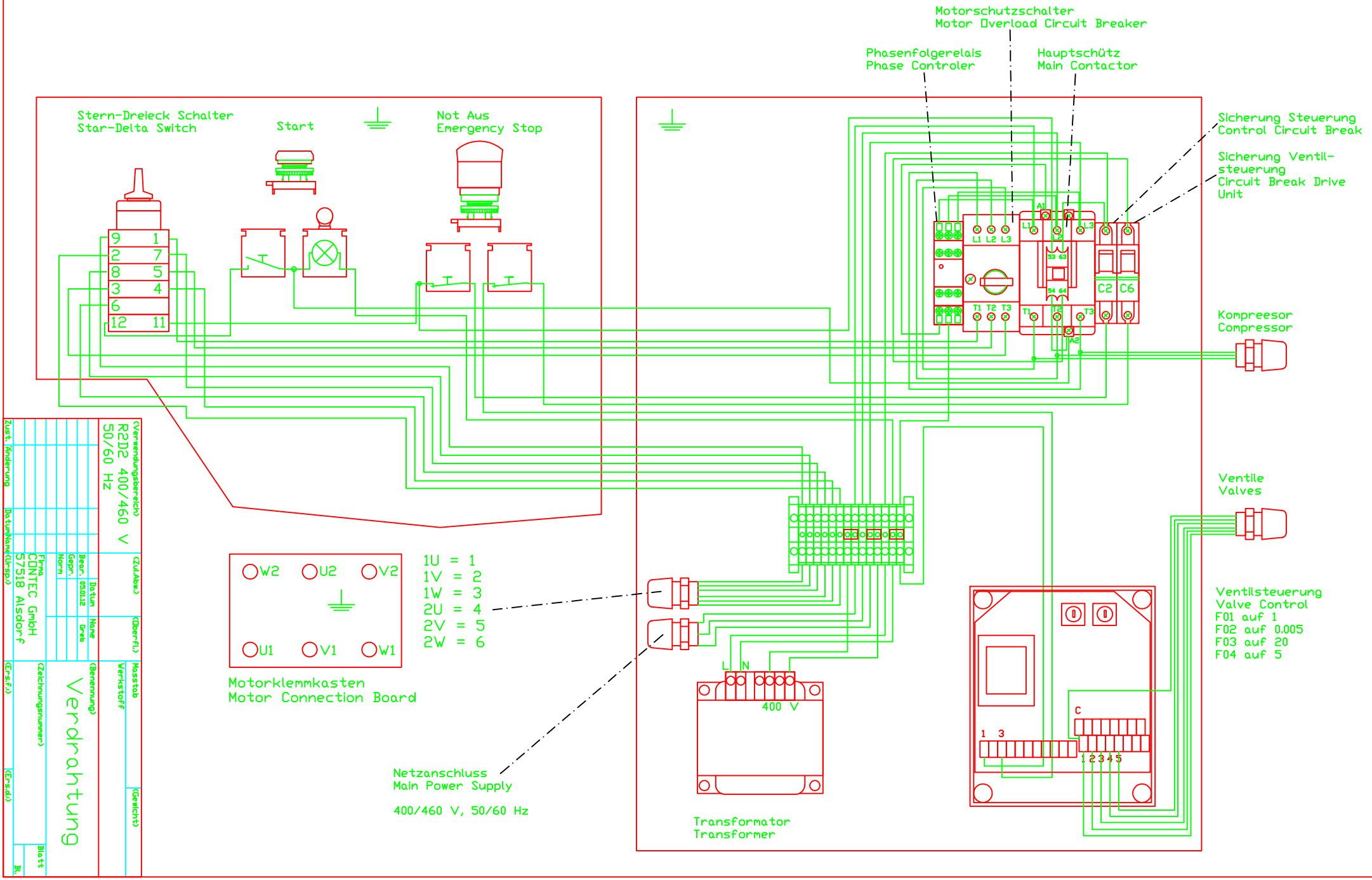
(c) Contec GmbH 2003

Klemmkasten Filtereinheit
Panel in Filter Unit





Verdrahtung R2D2
Wire Diagram R2D2



Artikel-Nr. / Part-No.	Bezeichnung 1	Bezeichnung 2	D-Nr
13-10-01-00	Maschinenrahmen R2D2 Kraftstation		1
80-21-31-00	Bockrolle R2D2		3
80-21-31-60	Lenkrolle R2D2/Tornado		5
13-10-01-17	Seitenblech links R2D2 P		7
13-10-01-21	Seitenblech rechts R2D2 P		9
13-10-01-20	Deckelblech R2D2 P		11
13-10-01-18	Seitenblech hinten R2D2 P		13
13-10-01-19	Seitenblech vorne R2D2 P		15
50-20-15-56-K	Schaltkasten komplett R2D2		17
90-26-01-40	Druckbehälter 40 Ltr. Kompressor R2D2 P		19
1.3645.30310	Kompressormotor mit Kolbenpumpe ECO 4	R2D2	21
1.3645.30340	Kompressormotor mit Kolbenpumpe ECO 4	US Version R2D2	21
1.3785.20120	Kompressormotor mit Kolbenpumpe ECO 3	R2D2 niedrige Ausführung	21
90-26-01-43	Wasserabscheider R2D2/Tornado		23
7.4851.00020	Kompressor Druckschalter ECO 3/40 D und	Contec-Ausführung und ECO 2	25
7.4851.00030	Kompressor Druckschalter ECO 4 D stat.	ECO 5 D R2D2/R2D2-7	25
90-26-00-63	Schalldämpfer R2D2/Tornado P		27
91-20-01-08	Druckstutzen R2D2 P		29
90-26-00-61	Saugstutzen mit Drosselklappe R2D2 P		30
90-26-00-60	Ventilator R2D2 P		31
70-24-10-87	Riemen R2D2 US Version/Tornado		33
70-24-11-62	Riemen R2D2 P		33
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50-20-32-01	Aufbaustecker Wendestecker 32 A 5P 380V	R2D2 P	43
50-26-03-08	Steuerleitung f. Ventile 3m R2D2 P		51
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50-20-20-121	Harting Buchseneinsatz Kraftstation	im Tüllengehäuse R2D2/R2D2-7	57
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90-26-52-10	Schlauchnippel mit Außengewinde 1/2"	R2D2 / Tornado	63

90-26-52-11	Schlauchnippel mit Außengewinde R2D2 3/8		63
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13-10-03-10	Druckrohr mit Ventilrohren R2D2 F		67
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13-10-05-05	Staubbehältergriff mit Griffgummi R2D2		87
90-20-45-40	Verschlußspanner R2D2/R2D2-7		89
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13-10-04-00	Fahrwerk Filterkammer R2D2		101
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1.5732.70190	Kompressor Komplett ECO 3/40D stationär	400 V 50 HZ Contec-Ausführung	
1.5737.40220	Kompressor Komplett ECO 4 D R2D2		
13-10-04-04	Radachse für Filterkammer Fahrwerk R2D2		
13-10-05-00	Staubbehälter 90 Liter R2D2		
13-10-05-02	Unterlage Gegenhalter R2D2		
4.0228.0	Pleuel Alu für ECO 3/2 Kompressor R2D2	Tornado	
4.0496.1	Entlüftungsstopfen ECO 3/2 Kompressor	R2D2 und Tornado	
4.0513.0	Zungenventil für ECO 2/3 Kompressor R2D2	Tornado	
4.0580.0	Kurbelflansch Hub 42 für ECO 3/2	Kompressor R2D2 und Tornado	
4.1479.00010	Winkelverschraubung an der Verbindung	Kupferleitung Druckschlauch ECO 3 R2D2	
4.2186.0	Luftrohr aus Kupfer ECO 3 R2D2		
4.2648.00010	Luftfilterhaube ECO3 Kompressor R2D2		
4.2792.0	Luftrohr ECO 4 R2D2		
5.0019.1	Kolben d=70 mm für ECO 4 Kompressor R2D2		
5.0050.1	Kolben d=50 mm für ECO 3 Kompressor R2D2		
5.0209.0	Zungenventil für ECO 4 Kompressor R2D2		
5.0551.1	Dichtung Zylinderfuß für ECO 3/ECO 2	R2D2/Tornado	
5.0966.0	Paßschraube im Kurbelflansch M12x1x33,5	für Kompressor ECO 3/2 R2D2 und Tornado	
5.1309.0	Dichtung Zylinderfuß ECO 4 R2D2		
5.1456.0	O-Ring FPM 80Sh.A 58,0x2,00 für ECO 3/2	Zylinderkopf R2D2 und Tornado	
5.1482.0	O-Ring FPM 80Sh.A 46,0x2,00 für ECO 3/2	Zylinderkopf R2D2 und Tornado	
5.1482.0	O-Ring FPM 80Sh.A 46,0x2,00 für ECO 3/2	Zylinderkopf R2D2 und Tornado	
5.5056.0	Dichtring Zylinderkopf unten ECO 4 R2D2		
5.5057.0	Dichtring Zylinderkopf oben ECO 4 R2D2		
50-20-20-06	Schildträger 111 (START) R2D2/R2D2-7		
6.0173.1	Kompressor Luftfiltergehäuse ECO 4/5 mit	Filter R2D2/R2D2-7	
6.0199.0	Luftfiltereinsatz ECO3/ECO2 Kompressor	R2D2 und Tornado	
6.0256.00010	Winkelverschraubung am Zylinderkopf ECO3	R2D2 und ECO 2 Tornado	
6.0356.0	Dichtkonus (Schneidring) für Winkel-	verschraubung ECO 3 R2D2	
6.0376.0	Überwurfmutter für Dichtkonus ECO 3 R2D2		

70-25-02-50	Unterdruckschlauch zum Eimer R2D2	Eimerversion	
70-25-11-25	Absaugschlauch DN 125 PU-Klar		
70-25-11-25-K	Absaugschlauch DN 125 mit Kunststoff-	spirale R2D2	
70-25-11-27	Absaugschlauch DN 127 Hoch Temp		
70-25-11-50	Absaugschlauch DN 150 PU-Klar R2D2		
70-25-11-50-K	Absaugschlauch DN 150 mit Kunststoff-	spirale R2D2	
70-26-30-00	Gummipuffer Kompressor Tornado/R2D2		
70-27-50-30	Stopfen für Fahrwerk R2D2		
8.0006.0	Kompressor ECO 4/5 Manometer an der	Entwässerungseinheit R2D2	
8.1366.0	Schlauchleitung DN 10 x 500 ECO 3 R2D2		
90-24-16-10-38	Riementrieb Taberlock für Motorwelle	DeltaI / R2D2 US	
90-26-00-01	Riemenscheibe Ventilator R2D2/Tornado		
90-26-01-41	Druckregler auf Druckbehälter R2D2 P		
90-26-01-42	Druckrohr zw. Kompressor und Druckbe-	hälter R2D2 ECO 3	
90-26-03-07	Ersatzmembrane 3/4" für Abreinigungs-	ventil R2D2/Tornado	
90-26-51-17	Schnellkupplung Stecker aus Messing R2D2	mit Schlauchtülle NW 13	
90-26-52-12	Doppelnippel mit Außengewinde 1/2" R2D2/	Tornado	

SERVICE MANUAL E

Reciprocating Compressor

Model: KC 350 – 40 D

GL – Nr.: 1_1814_00100 – 01 01

Part No.: 1.1814.00100
Serial No.: .....

Manufacturer:

KAESER KOMPRESSOREN GmbH

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http://www.kaeser.com

DECLARATION OF CONFORMITY

within the meaning of Machinery Directive 98/37/EC, Anex II A

KAESER KOMPRESSOREN

Specification of machine / assembly

Description	Reciprocating compressor
Model	**KC 350-40 D**
Material No.:	**1.1814.00100**
Serial No.:	

EG directives applied

98/37/CE	Machinery directive
73/23/CEE	Low Voltage Directive
87/404/CEE	Directive concerning simple, unfired pressure vessels
89/336/CEE	Directive concerning electromagnetic compatibility

Harmonised Standards applied

DIN EN 1012-1: 1996-07
DIN EN 292-1: 1991-11
DIN EN 292-2/A1: 1995-06
DIN EN 294: 1992-08
DIN EN 60204-1: 1998-11
DIN EN 55014-1: 2002-09
DIN EN 61000-6-2: 2002-08
DIN EN 61000-3-2: 2001-12 [1])
DIN EN 61000-3-3: 2002-05 [1])
DIN EN 61000-3-11: 2001-04 [1])

[1]) Insofar as the application falls within the requirements of the standard

The design of the machine supplied by us corresponds to the stated Directives and Standards within the meaning of the conformity assessment procedure carried out.

The machine design is not subject to 97/23/CE directive on pressure equipment (see separate Declaration of Conformity). Technical documents are archived with the manufacturer in accordance with 2000/14/CE.

Coburg	03.03.2003	
Location	Date	Director

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KAESER COMPRESSORS

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1 Technical Specification

1.1 Compressor Unit

Model	KC 350–40 D	
Maximum gauge working pressure	10	bar
Weight	51	kg

Air receiver:

Capacity	40	l
Max. permissible gauge working pressure	11	bar

Drawings:

Dimensional drawing	K1.1814.00030
Electrical diagram	SKK.D–00400.00

1.2 Sound emission

Guaranteed sound power level (to 2000/14/EG Directive)	99	dB (A)
Emission sound pressure level	74	dB (A)

calculated from the measured mean sound power level (Directive 2000/14/EG, basic standard for noise measurement ISO 3744) to EN ISO 11203:1995 para. 6.2.3.d at distance d= 1m, Q2= 14,1 dB (A).

1.3 Compressor Block

Model	KC 350 D	
Theoretical inlet capacity	350	l/min
Free air delivered at 6 bar gauge working pressure	230	l/min
Maximum gauge working pressure	10	bar
Number of cylinders	1	
Speed	1800	min^{-1}
Oil capacity	0,2	l
Oil top–up quantity	0,1	l

1.4 Electrical Connection

Mains voltage	460 ± 10%	V
Phases	3 / N / PE	
Frequency	60	Hz
Max. mains fusing (slowblow or gl class)	6	A
Power supply cable core cross–section (CU multiple core cable)	4 x 1,5	mm^2
Maximum rated current I_N	3,5	A

1.5 Drive Motor

Rated power ..... 1,7 kW

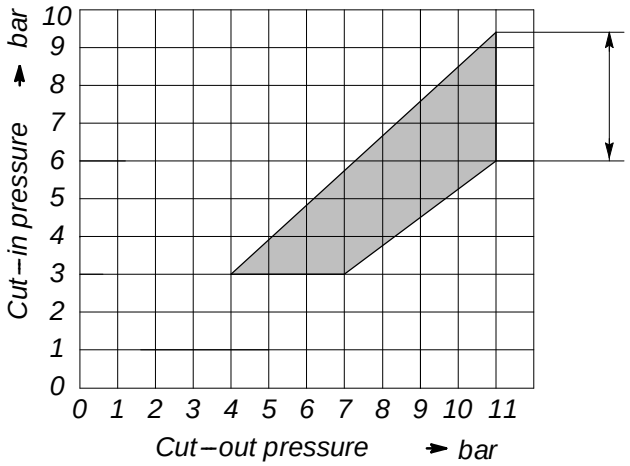
Rated speed ..... 1800 min^{-1}

Protection class ..... IP 54

Max. cut–in frequency ..... 30 times/hour

Starting ..... direct start

1.6 Air Main Pressure Switch Setting



MDR 3/11

Possible adjustment range of the air main pressure switch

Works settings:

Gauge cut–in pressure p_{min} ..... 7 bar

Gauge cut–out pressure p_{max} ..... 9 bar

Pressure difference Δp ..... 2 bar

1.7 Safety Valve Setting

Opening pressure ..... 11 bar

1.8 Installation Requirements

Max. height above sea level at place of installation ..... 1000 m

Min. ambient temperature ..... 5 °C

Max. ambient temperature ..... 35 °C

1.9 Recommended Oil

Craftsmen's compressors are filled with the highly suitable oils listed below:

Description	**Oil sort of the Viscosity group VG 5, DIN 51562**	**maximal permissible fluid change interval in operating hours/ years**	**material number 0.5 l**
special high performance oil for craftsmen's compressors	SAE 5 W 30	1000 / 2 *	9.4943.00010

* Cool to moderate ambient temperatures, low humidity, high duty cycle

1.10 Air Receiver Charging Time

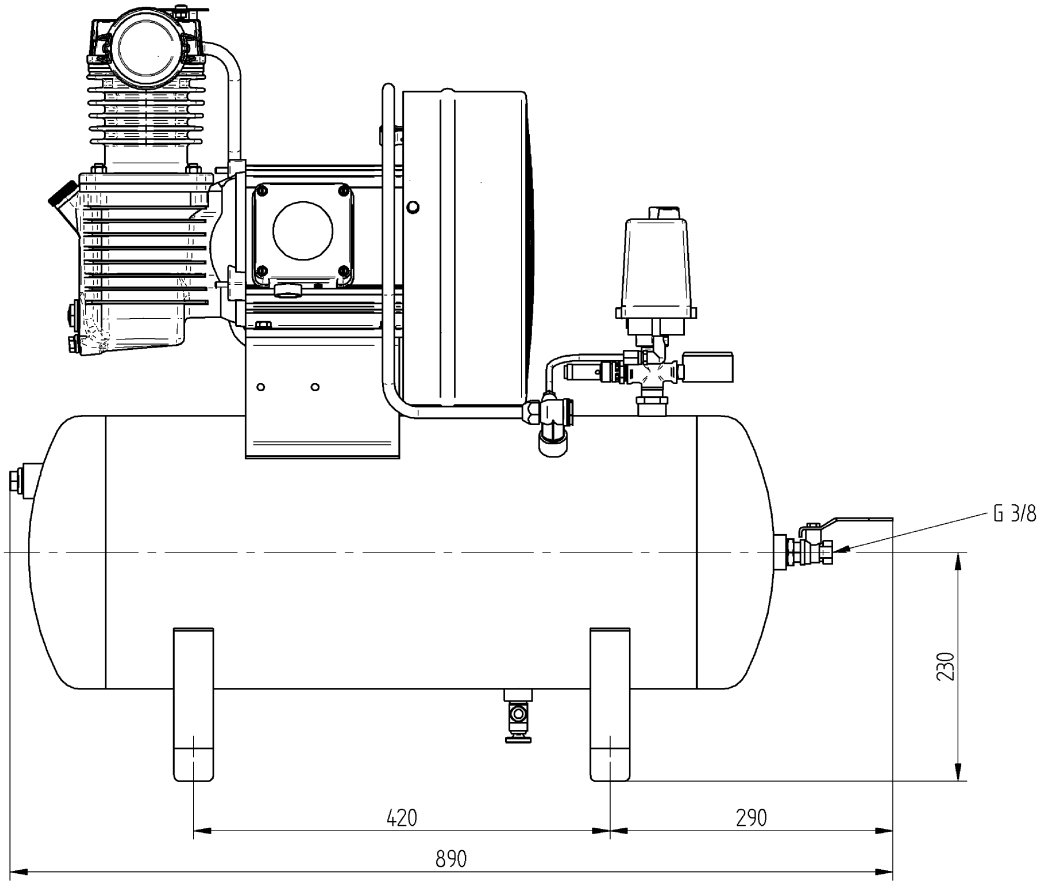
Air receiver charging time to 3 – 8 bar 0 min 50 s

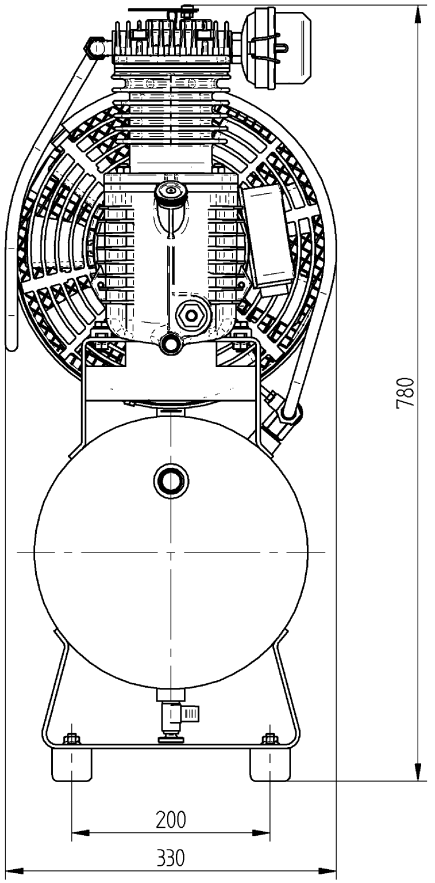
1.11 Dimensional Drawing

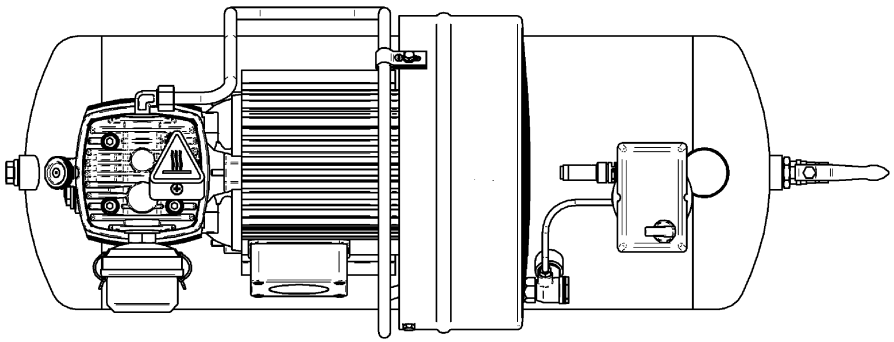
(see following page)

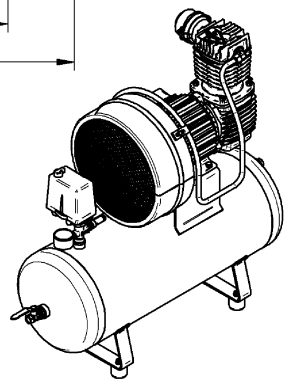
Die Zeichnung bleibt unser ausschließliches Eigentum. Sie wird nur zu dem vereinbarten Zweck anvertraut und darf zu keinem anderen Zweck verwendet werden. Kopien oder sonstige Vervielfältigungen einschließlich Speicherung, Verarbeitung oder Verbreitung unter Verwendung elektronischer Systeme dürfen nur zu dem vereinbarten Zweck angefertigt werden. Weder Original noch Vervielfältigungen dürfen Dritten ausgehändigt oder in sonstiger Weise zugänglich gemacht werden.

Entwicklungsbedingte Änderungen vorbehalten. Zeichnung darf nur über CAD geändert werden.









	Tag	Name	
Gez.	18.09.2003	Geiger1	KC 350-40 D
Gepr.			
Freigeg.	18.09.2003	Schaef1	
Maßstab	1:5		Ersatz für

KAESER KOMPRESSOREN

K1_1814_00030 A-Index

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2 Safety Regulations

Disregarding this notice can result in serious injury!

This manual should be read and the instructions it contains followed before initial start–up and before carrying out maintenance work.

The machine is constructed to the latest technological standards and to accepted safety regulations.

Despite this fact, physical danger to the user or third parties or damage to the machine and other property exists.

Use the machine as specified according to the service manual and only if it is in perfect technical order!

Repair defects that could degrade safety (or have them repaired) immediately!

2.1 Explanation of Symbols and References

This symbol is placed before all regulations concerning safety where danger to life and limb can occur during work. It is especially important that these regulations are observed and that extreme care is taken. For their own protection, inform all other users of these safety regulations. Observe all general safety and accident prevention regulations as well as the those laid down in this service manual.

Attention! **This symbol is placed by text where considerable attention must be paid to recommendations, regulations, references and the correct sequence of work so that damage and/or destruction of the compressor unit and/or other equipment is prevented.**

This symbol identifies environmental care measures.

☞ **This symbol indicates operations and actions to be carried out by the operator or service technician.**

- **This bullet identifies listings.**

Explanation of the warning label on the compressor unit:

Warning:
Do not touch hot surfaces.

2.2 Safety Notes

Work on power--driven equipment may only be carried out or supervised by persons trained in that particular equipment or by a specialist.

Work on electrical equipment in the compressor may only be carried out according to electrical engineering regulations by a qualified electrician, or trained personnel under the supervision of a qualified electrician.

Before work is carried out on electrical systems, carry out the following measures in the sequence shown:

Switch off all phases.

Ensure the unit cannot be switched on again.

Check that no voltage is present.

The following actions must be carried out in the order given before working on any pressurised parts or enclosures (e.g. pipes, vessels, valves).

1. Shut off and depressurize all pressurized components and enclosures

2. Secure them in the depressurized state

3. Check that they are indeed de--pressurized

Attention! **Any alterations or reconstruction carried out without consultation with and the previous consent of KAESER COMPRESSORS will invalidate the warranty.**

Attention! **No welding, heat--treatment or mechanical work may be carried out on pressure retaining conponents, e.g. pipes, air mains, receivers, etc.**

Safety devices may not be modified or deactivated.

Signs and marks of reference may not be removed or rendered unreadable.

We also recommend observation of the following:

- Allow no open flame and flying sparks in the place of installation.
- During any necessary welding on the compressor unit or nearby ensure that sparks or high temperatures cannot cause fire or explosion.
- Ensure that the compressor unit is supplied with clean air free of damaging components.
- The ambient temperature should not rise above or fall below the limits defined in chapter 1.8. If this is the case, special measures must be agreed between the manufacturer and the user.

- This machine is not explosion–proof.
  It may not be operated in areas in which specific requirements with regard to explosion protection are applied.
  These are, for example, the requirements for “specified use in hazardous explosive environments” according to the 94/9/EU ATEX Directive.

2.3 Electrical Safety

Attention!

The electrical system of a compressor unit must comply with the provisions of the European Standards EN 1012 -- 1 and EN 60204 -- 1) and, if necessary, with the local electricity supply authority regulations.

Compressor units must be fitted with a main isolating device, the operation of which determines the start and end of the energy supply.

Main isolating devices can be main switches or plug and socket connections.

For this reason the following measures must be taken at the place of installation:

Compressor units fitted with a drive motor of drive power 3 kW or more and a current rating of 16 amperes or more must be fitted with a lockable main switch (see EN 60204 -- 1, para. 5.3) and mains fuses.

The main switch must be designed according to the maximum rated current I_N (see chapter 1.4).

See chapter 1.4 for details of the cable cross--sections and mains fuses.

Compressor units fitted with a drive motor of drive power less than 3 kW and a current rating of less than 16 amperes may be fitted with a mains plug connection.

2.4 Spare Parts

Safe and reliable operation of the compressor unit is guaranteed only with KAESER original spare parts.

2.5 Environmental Protection

Condensate drainage

Condensate accumulating during compression must be drained via a suitable draining system and collected in disposal canisters. The condensate must be disposed of according to environmental regulations.

Operational and repair materials, used parts

Dispose of all used materials and parts accumulating during operation, maintenance and repair of the compressor unit according to environmental care regulations!

Disposing of the Machine

When disposing of a machine, drain out all liquids and remove dirty filters.

Any parts contaminated with oil must be disposed of in accordance with local environment regulations.

☞ Take the machine out of service (see chapter 8.1).

☞ Drain all oil completely from the machine (see chapter 9.5).

☞ Remove dirty filters.

Use the services of an approved local disposal specialist to ensure environmentally correct disposal of the empty machine.

3 General

Attention! **The service manual must always be available at the compressor unit's place of use**

3.1 Correct Use of the Compressor

The compressor unit is intended solely for the purpose of generating compressed air. Any other use is considered incorrect. The manufacturer cannot accept liability for any damage caused by such incorrect use; the user alone is liable for any risks incurred.

Correct use of the compressor also encompasses compliance with the installation, removal, commissioning, operational and maintenance conditions laid down by the manufacturer.

Attention! **The equipment may only be used or serviced by persons who are authorised and trained.**

The machine is intended solely for industrial use and application in industrial facilities. Any other use or application is forbidden. The manufacturer is not liable for any damages resulting from such unspecified use or application. The user or operator alone bears the risk for such damages.

This applies especially to the obligation

- to become acquainted with the fundamental safety regulations that apply to compressed air engineering
- to refuse access to the machine by persons under the age of fourteen, and
- to have the technical condition of the machine inspected within the intervals prescribed for industrial use.

3.2 Incorrect Use

Never direct compressed air toward persons. Compressed air is a concentrated form of energy and as such is dangerous to life.

Attention! **Inlet air may not contain any explosive or chemically unstable gas or vapour.**

3.3 Compressed Air Treatment

Never use compressed air for breathing purposes and production methods where the air has direct contact with food without subjecting the compressed air to additional treatment.

3.4 Copyright

The copyright of this service manual is the property of the KAESER Company. This service manual is intended for operating personnel, maintenance personnel and supervisory personnel use only. It contains instructions and technical diagrams that may not be copied, either completely or partly, distributed or evaluated by unauthorised persons for the purpose of competition, or divulged to any other third party.

3.5 Accompanying Documents

With this Service Manual are documents intended to assist in safe and sure operation of the compressor:

- Certificate of acceptance / operating instructions for the pressure vessel
- Conformity or Manufacturer's Declaration in accordance with applicable directives

☞ Make sure all documents are to hand and their contents understood.

Request the supply of any missing documents from KAESER.
Make sure you give the data from the nameplate.

3.6 Handling the Document

The service manual is part of the machine.

☞ Keep the service manual safe throughout the life of the machine.

☞ Pass the manual on the the next owner/user of the machine.

☞ Ensure that all amendments are entered in the manual.

4 Transport and Storage

4.1 Take the machine out of service

The machine must be correctly taken out of service in preparation for transport for transport.

☞ Switch the machine off (see chapter 8.1).

Electric shock can kill!

DANGER Touching electrically live components can cause serious injury or death.

Power and control terminals may still be live when the motor is stopped.

- ☞ Switch off and lock out the main switch.
- ☞ Wait at least five minutes before checking for electrical voltage.
- ☞ Work carefully.

☞ Isolate the machine from the air main by closing the user's compressed air inlet and outlet shut–off valves. Initial and final pressure gauges must read zero.

Allow the machine to cool down completely.

☞ If the machine is water–cooled, shut off the water supply, drain the water completely from the heat exchanger and dispose of it according to environmental regulations.

☞ Disconnect all supply lines.

4.2 Packaging

Always observe the instructions in chapter 4.6 when packaging the machine for storage.

Use packaging suitable for the intended route if the machine is to be transported further by the customer.

Overland

The machine should be protected from mechanical damage by a sturdy crate and from moisture by plastic sheeting.

By sea or air

Special packaging instructions can be obtained from KAESER.

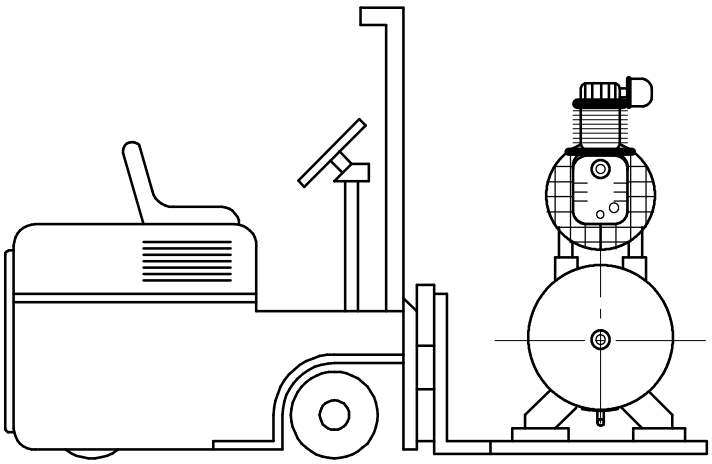
Dispose of the packaging according to environmental regulations and recycle where possible.

4.3 Transport Instructions

A fork lift truck or lifting cradle should be used to avoid damaging to the machine.

4.4 Transporting with a fork lift truck or pallet truck

In order to move the machine by means of a fork or pallet truck it must be on a suitable pallet or transport frame.



4.5 Transport Using a Crane

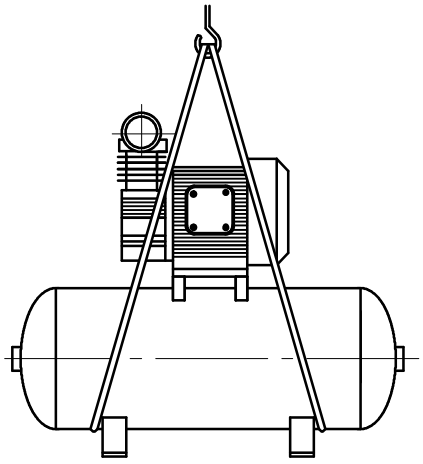
Attention! **If the compressor unit is transported by a crane the safety regulations concerning lifting appliances must be observed.**

Do not stand underneath hanging loads.

Do not exceed the max. permitted lifting weight of the lifting appliance.

Always use a sling when transporting the compressor unit with a crane.

Attention! **Take care not to damage parts of the compressor when lifting with the sling.**



4.6 Storage

The machine must be adequately packed.

☞ Store the machine in a dry, frost–free room.

☞ Prevent entry of moisture and condensation.

If the equipment is to stand idle for a long period the prescribed measures must be taken to avoid damage.

If any measures can not be taken, advice should be sought from the authorised KAESER Service depot.

As an alternative to storage, the equipment can be run once a week for 30 minutes at operating temperature to ensure adequate corrosion protection.
Otherwise, the measures described under 'Storage for longer than 6 months' are to be taken.

Storage for longer than 6 months

Ensure the machine is dry and cover in plastic sheeting. Protect the interior with sufficient quantities of desiccant (silica gel or similar).

Storage for longer than 12 months

Carry out the following additional maintenance tasks before putting into operation:

☞ In oil–lubricated machines the oil and, where present, the oil filter must be changed.

☞ have the motor bearings checked by an authorised KAESER service technician.

Storage for longer than 3 years:

after 3 years at the latest the complete technical condition of the machine must be checked before start–up.

Damage to the machine can occur if the condition is not checked.

CAUTION ☞ Have the the start–up carried out by an authorised KAESER service technician.

5 Construction and Operation

Items in ( ) refer to components with item number in the schematic diagram of the compressor unit (see chapter 5.4).

5.1 Principle of Compression

This reciprocating compressor is an air cooled, oil lubricated compressor using the principle of single stage compression

Atmospheric air is drawn into the compression chamber of the compressor block (2) through the air filter (1). Air is drawn in via the valve plate in the cylinder head during the downward motion of the piston from the top to the bottom dead centres. After the piston has reached the bottom dead centre position the air is compressed within the cylinder by the upwards motion of the piston. Simultaneously the inlet valves in the valve plate close and the discharge valves open.

The compressed air now enters the air receiver (4) via a nonreturn valve (3). The nonreturn valve prevents the compressed air from flowing back into the compressor block when the compressor unit is stopped.

5.2 Short Description

The compressor block is driven by an electric motor (7). The compressor block is directly coupled to the motor via the motor shaft.

The end of the motor shaft is designed as a crankshaft. A fan supplying the necessary cooling air for the motor and the compressor block is fitted to the N–end of the motor shaft. The heat generated is dissipated via the cooling fins on the cylinder and the cylinder head.

The crankshaft is supported by roller bearings; the connecting rod is supported by shell bearings. The cylinder liner, piston, crankshaft and connecting rod are automatically splash lubricated.

To enable an unloaded start the pressure switch (6) is fitted with an unloading valve.

A nonreturn valve (3) is fitted upstream of the air receiver (4) to prevent compressed air flowing back from the air receiver.

The air receiver (4) is constructed to the regulations of the pressure vessels act and fitted with all necessary fittings such as safety valve (5), pressure gauge (8), pressure switch (6) and nonreturn valve (3).

5.3 Compressor Control (Stop–Start Control)

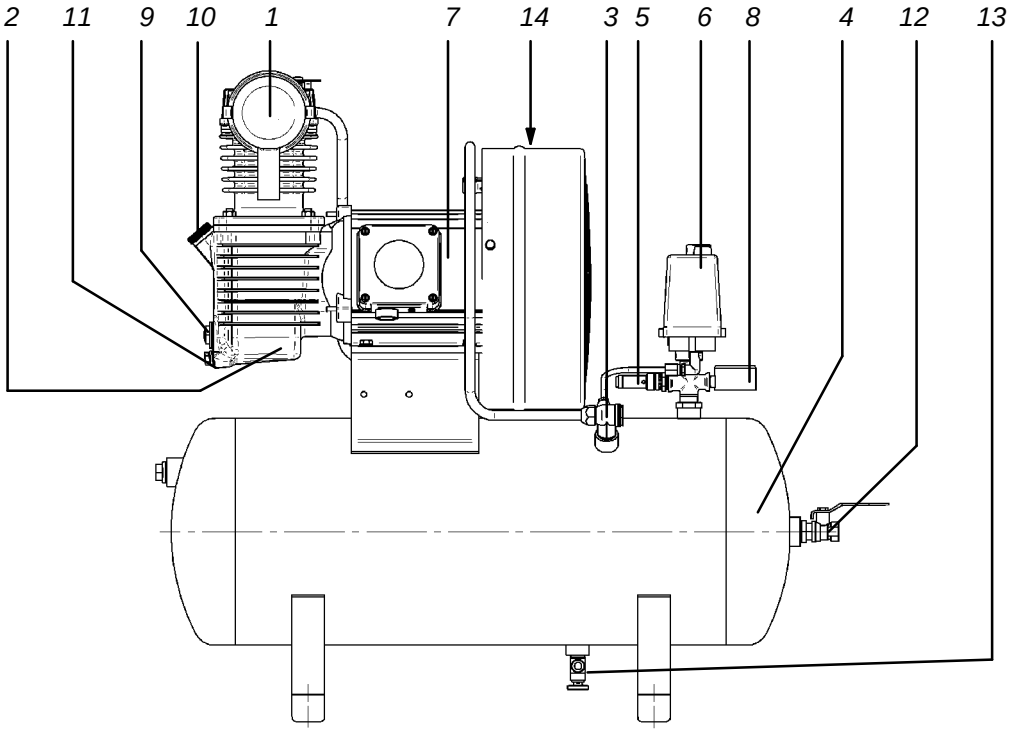
The compressor is controlled by the pressure switch.

After the compressor is first switched on the pressure switch switches the compressor, depending on the air demand, between the two operating states ”load” and ”standstill” within the limits p_{min} / p_{max}.

See chapter 1.6 for the works setting of the pressure switch.

The compressed air pipe from the compressor block up to the nonreturn valve is vented when the cut–out gauge pressure is reached to ensure an unloaded compressor start.

5.4 Components of the Compressor Unit



1 *Air filter*
cleans
the inlet air

2 *Compressor block*
draws in the air and compresses
it to the discharge pressure

3 *Nonreturn valve*
prevents the compressed air from
flowing back into the block

4 *Air receiver*
compressed air tank and
accumulation of condensate

5 *Safety valve*
protects the air receiver, blows off
if the max. working pressure is exceeded

6 *Pressure switch*
controls compressor stop and start

7 *Electric motor*
drives the compressor block;
Fan on N shaft end provides
the necessary cooling air

8 *Pressure gauge*
indicates the current pressure
in the air receiver

9 *Oil level sight glass*

10 *Oil filler with crankcase venting*
plug

11 *Oil drain plug*

12 *Compressed air discharge connection*
to the air mains

13 *Condensate drain cock*

14 *Direction arrow on the fan guard*

6 Installation

6.1 Installation Instructions

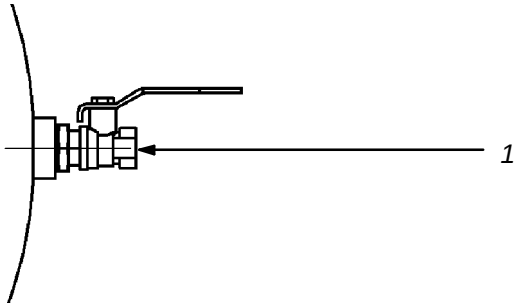
To ensure sufficient ventilation, the compressor unit must be installed with a minimum distance of 0.5 metres to the wall.

Safe operation of the compressor unit is only ensured if the ambient temperature remains within the limits stated in chapter 1.8).

If the compressor is used in the open, take care that it is protected against the direct rays of the sun and against the ingress of dust and rain.

6.2 Connection of the Compressed Air Supply

The compressor unit is piped ready for use.



KGB006011

1 Compressed air discharge connection

A compressed air connection is provided for the consumers. The consumers are connected via a flexible hose and a quick release hose coupling.

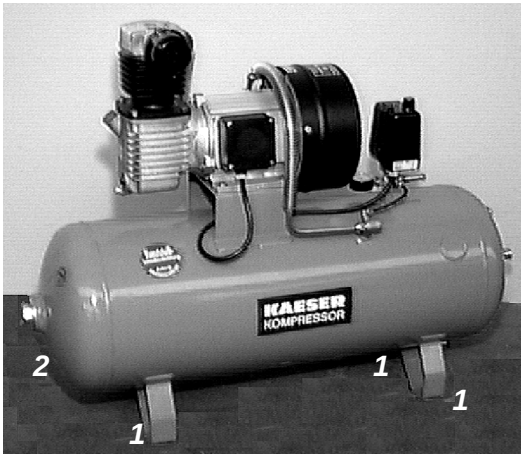
6.3 Fitting the Antivibration Mounts

The antivibration mounts supplied with the compressor unit (as a separate package fixed to the compressor block) must be fitted before the compressor is first put into operation.

Attention! **Use transporting belts to lift the compressor unit. Observe the instructions in chapter 4.5.**

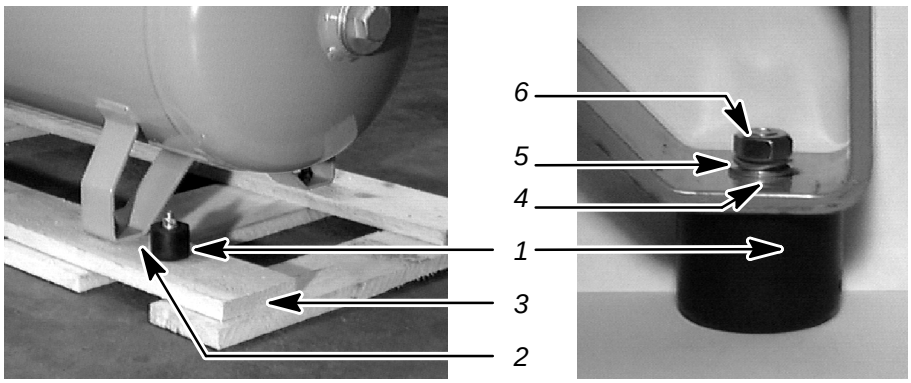
The compressor can tip because of its own weight and high point of gravity.

Attention! **The antivibration pads must be fitted according to the arrangement shown in the following diagram.**



1 Antivibration mount soft (40 Sh) 4.1493.0

2 Antivibration mount hard (90 Sh) 4.1476.0



1 Antivibration mount
2 Fastening bolts
3 Wooden base
4 Washer
5 Spring washer
6 Hexagonal nut

☞ Lift up the compressor unit with the transport belt. Observe the instructions in chapter 4.5.

☞ Unscrew the bolts (4) and remove the wooden base (3) from the feet of the air receiver.

☞ Fit the antivibration mounts (1) with washers (4), spring washer (5) and hexagonal bolt to the feet of the air receiver.

6.4 Electrical Connection

The connection to the power supply and the protective measures necessary are to be carried out to the provisions of the European Standards EN 1012 -- 1 and EN 60204 -- 1 and to the regulations of the local Electricity Supply Authority by an authorised electrician.

Attention!

For this reason, the following measures must be carried out at the place of installation:

Compressor units fitted with a drive motor of drive power 3 kW or more and a current rating of 16 amperes or more must be fitted with a lockable main switch (see EN 60204 -- 1, para. 5.3) and mains fuses.

Compressor units must be fitted with a main isolating device, the operation of which determines the start and end of the energy supply.

Main isolating devices can be main switches or plug and socket connections.

The main switch must be designed to according to the maximum rated current I_N (see chapter 1.4).

Compressor units fitted with a drive motor of drive power less than 3 kW and a current rating of less than 16 amperes may be fitted with a mains plug connection.

- The electrical installation of the compressor unit must be carried out according to the electrical diagram (see chapter 11.1). The connection to the power supply is made with a mains plug.

Attention!

The supply cable and fuses are selected to DIN VDE 0100, sect. 430 and 523 for an ambient temperature of 30 °C. Under other operating conditions such as a higher ambient temperature or longer supply cables (longer than 50 metres) the cross--section of the supply cables and the fuses must be checked and selected according to DIN VDE 0100 and to the regulations of the local electricity supply authority.

See chapter 1.4 for details of the cable cross--sections and mains fuses.

7 Putting into Operation

7.1 Points to be Observed before Putting into Operation

Every compressor unit is given a test run in the factory and carefully checked before shipment. The test run confirms that the compressor unit conforms to the specification data and runs perfectly. However, independent of the checks made at the factory, the compressor unit could be damaged during transport. For this reason, we recommend that the compressor unit is examined for such possible damage. Observe the compressor unit carefully during the first hours of operation for any possible malfunction.

Attention! **Work on power driven systems may only be carried out by trained or specialised personnel.**

Work on the electrical system and equipment of the compressor unit may only be carried out by a skilled electrician or by instructed personnel under the supervision and guidance of a skilled electrician and in accordance with electrical engineering rules and regulations.

Attention! **Important functional components in the compressor unit such as the nonreturn valve and safety valve are set up and fitted at the factory to precise setting up regulations. Changes are not permitted without previous consultation with KAESER.**

The nonreturn valve and the safety valve are spring loaded.

Points to be observed before starting the compressor unit:

ANY NON--OBSERVANCE OF THESE OR OTHER REFERENCES (WARNING; ATTENTION) CAN LEAD TO ACCIDENTS CAUSING INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT.

The machine restarts automatically after a power failure provided the air main pressure is lower than the cut--out pressure level set on the air main pressure switch.

- It is expected that the operator employs safe working methods and that all valid and, if applicabel, all local operating and safety regulations are complied with when operating the machine.
- The user of this machine is responsible for its safe operating condition.
- Do not operate this machine in spaces where high dust pollution, poisonous or inflammable vapours or gases could exist.
- Do not connect the machine to a supply voltage other than that stated on the nameplate.
- Do not install the machine in a space subject to freezing temperatures, whereby the air temperature conditions at the compressor's air inlet must be complied with (see chapter 1.8).
- Check the level of the oil in the compressor block. If necessary, top up according to the oil recommendations (see chapter 1.9).

7.2 Direction of Rotation Check

- Check the direction of rotation by switching on the compressor for a short period. If the direction of rotation does not coincide with the arrow located on the fan guard, change over terminals L1 and L2.

7.3 Setting up the Overload Protection Trigger

Before any adjustments are carried out to the compressor package break the power supply by operating and locking out the main isolating device (main switch or mains plug) to prevent an accidental compressor start.

Attention! **Three--phase motors may be only be run with a correctly adjusted overload protection trigger.**

The motor overload protection trigger is set at the factory with the standard setting.

Compressor drive motor: direct on--line start

The compressor unit starts directly on line and is controlled by a pressure switch combination. The pressure switch switches the compressor unit on and off within preset pressure limits and the integral thermal overload protection trigger ensures that the compressor unit is shut down if the current flowing exceeds the preset value.

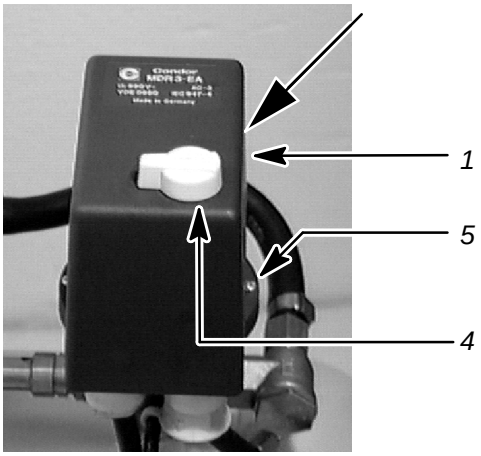
Setting: rated motor current (see motor nameplate).

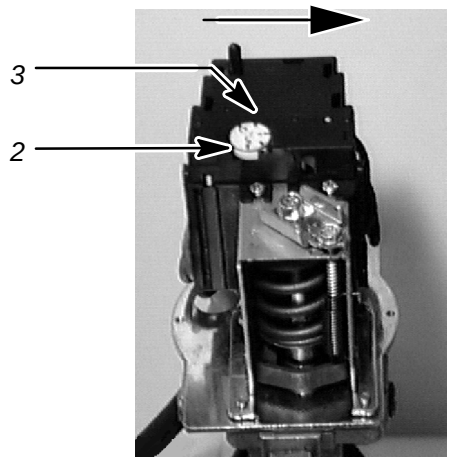
The setting can be up to 10% higher than the rated motor current to prevent voltage fluctuations triggering the overload protection trigger.

If the thermal overload protection has triggered and shut down the compressor unit the ON/OFF switch switches to the ''OFF'' position. Start the compressor unit again by setting the switch to the ''AUTO'' position.

Attention! **If the compressor unit does not immediately start, wait until the drive motor has cooled down.**

If the motor overload protection triggers several times in sequence, other causes maybe responsible for triggering the overload protection (e.g. low insulation of the motor windings or cables, seized motor.) If this occurs, have a specialist check the compressor and motor to find the cause of the problem.





1 Cover
2 Dial
3 Mark (▼)
4 ON/OFF switch
5 Screw

If necessary adjust the motor overload protection trigger setting as follows:

☞ Shut down the compressor.

Break the power supply by operating and locking out the main isolating device (main switch or mains plug) to prevent an accidental compressor start.

☞ Loosen the screws (5) to the right and left of the cover (1).

☞ Remove the cover (1) of the pressure switch.

☞ Turn the dial (2) with a screwdriver so that the mark (▼) coincides with the value of the rated motor current on the dial (2).

Replace the cover (1) after every adjustment of the pressure switch and before starting the compressor unit.

☞ Replace the cover (1).

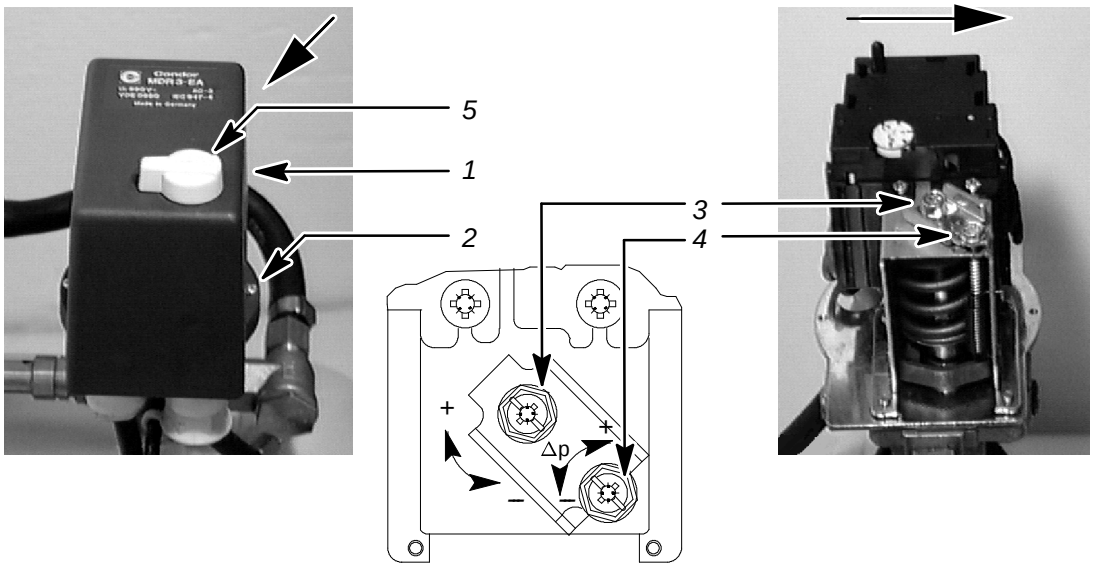
7.4 Setting up the Pressure Switch

Break the power supply by operating and locking out the main isolating device (main switch or mains plug, see chapter 2.3) to prevent an accidental compressor start before any adjustments are carried out to the compressor unit.

See chapter 1.6 for the factory setting of the pressure switch and the pressure diagram.

Attention! **The pressure setting can only be changed with the pressure switch fitted and under pressure.**

Attention! **Do not set the maximum cut--out pressure higher than the maximum gauge working pressure (see chapter 1.1).**



1 Cover
2 Screw
3 "Upper switching point" (Cut–out pressure) adjusting screw
4 Pressure difference adjusting screw
5 ON/OFF – Switch (OFF/AUTO)

☞ Shut down the compressor unit (see chapter 8.1).

Break the power supply by operating and locking out the main isolating device (main switch or mains plug) to prevent an accidental compressor start.

☞ Unscrew the screws (2) to the right and left of the cover (1).

☞ Remove the cover (1) of the pressure switch.

☞ Carry out the adjustment of the pressure switch.

Replace the cover (1) after every adjustment of the pressure switch and before starting the compressor unit.

☞ Replace the cover (1).

To increase the cut--out pressure:

☞ Turn the screw (3) clockwise in the "+ "direction.

To decrease the cut--out pressure:

☞ Turn the screw (3) counterclockwise in the "– " direction.

To increase the pressure difference between the cut--in and cut--out pressures:

☞ Turn the screw (4) clockwise in the "+ " direction.

To decrease the pressure difference between the cut--in and cut--out pressures:

☞ Turn the screw (4) counterclockwise "–"direction.

7.4.1 Cut--in frequency of the compressor unit from "standstill" to "load"

The cut–in frequency of the compressor unit from "standstill" to "load" can be changed within a limited range by changing the switching difference. To change the cut–in frequency the pressure switch must be adjusted (see chapter 7.4).

Attention! **See chapter 1.5 for the maximum cut--in frequency from "standstill" to "load" per hour.**

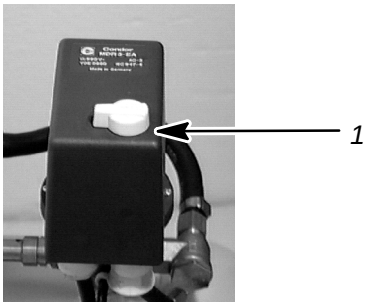
- Increasing the switching difference causes a decrease in the cut–in frequency.
- Decreasing the switching difference causes an increase in the cut–in frequency.

8 Operation

8.1 Starting and Stopping the Compressor Unit

Starting the compressor unit

☞ Operate the main isolating device (main switch or plug, see chapter 2.3).



1 ON/OFF switch

''0'' position = OFF
''I'' position = AUTO

☞ Switch on the compressor unit at the pressure switch (turn switch to position ''I'').

Shutting down the compressor unit

☞ Switch off the compressor unit at the pressure switch (turn switch to position ''0'').

☞ Operate and lock out the main isolating device to isolate the compressor from the mains power supply.

8.2 Faults and their Removal

Always comply with all general and local safety regulations when carrying out faultfinding and repair.

Restarting after a fault:

see chapter 7."Initial Start–up"

Explanation of symbols in the following faultfinding help:

✳ 1 – have checked by a specialist.

✳ 2 – contact KAESER service support.

8.2.1 Compressor does not start

Possible cause:	Remedy:
No motor power supply, fuses blown.	Replace the fuses; ✳ 1.
Contact in pressure switch defective.	Renew the pressure switch; ✳ 1.
Motor overload protection triggered.	Check the setting (see chapter 7.3); ✳ 1.

8.2.2 Compressor starts with difficulty

Possible cause:	Remedy:
Unloading valve at the pressure switch not opening.	Renew the unloading valve (see chapter 9.10); ⁎ 1.
Damaged bearings.	Renew the bearings or fit an exchange compressor; ⁎ 2.
Pistons siezed (no oil or wrong oil).	⁎ 2.
Power supply fault (2–phase running).	Check the power supply (fuses); ⁎ 1.
Oil level too high.	Reduce the oil level to the maximum mark on the oil level sight glass (see chapter 9.3).

8.2.3 Compressor overheating

Possible cause:	Remedy:
Ambient temperature too high (over 40 °C).	Lower the ambient temperature (see chapter 1.8).
Wrong direction of rotation (observe the direction arrow).	Change over L1 and L2 terminals (see chapter 7.2); ⁎ 1.
The fan cannot draw in air freely.	Ensure that inlet air is available for the fan.
Valve plate leaking, coked or the valve reeds are broken.	Check, decoke or renew valve plate; ⁎ 1 and ⁎ 2.

8.2.4 The motor overload protection triggers after a short period

Possible cause:	Remedy:
Power supply fault (2–phase running).	Check the power supply (fuses); ⁎ 1.
Defective motor.	Change the motor; ⁎ 1 und ⁎ 2.

8.2.5 The motor overload protection triggers after a long period

Possible cause:	Remedy:
Setting too low.	Check the setting (see chapter 7.3); ⁎ 1.
Current too high because of low supply voltage.	Check the cross–section of power supply cable (see chapter 6.4); ⁎ 1.
	Check the power supply terminals; tighten the screws.

8.2.6 Compressor runs continuously, discharge pressure not reached

Possible cause:	Remedy:
Air filter clogged.	Clean or renew the air filter (see chapter 9.6); ⁜ 1.
Valve plate leaking, coked or valve reeds broken.	Check, decoke or renew valve plate; ⁜ 1 and ⁜ 2.
Pressure losses within the unit.	Brush soapy water on piping and fittings, seal leaks, renew leaking parts; ⁜ 1.
Air demand higher than the capacity of the compressor.	Extend the compressed air supply.
Losses at the consumer / in the air main.	Check for possible leakage points.

8.2.7 Compressor cutting in too often

Possible cause:	Remedy:
Air receiver filled with condensate up to the discharge cock.	Drain the condensate (observe environmental care regulations), carry out routine maintenance regularly (see chapter 9.4); ⁜ 1.

8.2.8 Compressor shuts down, air escapes constantly at the unloading valve

Possible cause:	Remedy:
Defective nonreturn valve.	Renew the seal or renew the valve cone (see chapter 9.7); ⁜ 1.

8.2.9 Air escapes from the unloading valve when the compressor is running

Possible cause:	Remedy:
Unloading valve not closing (dirty or defective).	Renew the unloading valve (see chapter 9.10); ⁜ 1.

8.2.10 Unloading valve not unloading after shut--down

Possible cause:	Remedy:
Dirty unloading valve.	Renew the unloading valve (see chapter 9.10); ⁜ 1.

8.2.11 Air escapes from the pressure switch

Possible cause:	Remedy:
Defective diaphragm.	Renew the pressure switch; ⁜ 1.
Unloading valve does not close.	Renew the unloading valve; ⁜ 1.

8.2.12 Whistling noises at the cylinder head

Possible cause:	Remedy:
Loose cylinder head bolts or defective gaskets.	Tighten the bolts or renew the gaskets; ⁜ 1 and ⁜ 2.

8.2.13 Safety valve blowing off prematurely

Possible cause:	Remedy:
Safety valve blows, even though the cut–out pressure is not yet reached.	Check that the pressure gauge functions correctly, replace if necessary. Check the pressure setting.
Defective valve spring.	Renew the safety valve; ⁜ 1.
Safety valve was opened, dirt particles stuck in valve seat.	Open the safety valve completely for a short period to allow it to blow itself clean.

8.2.14 Oil consumption of compressor too high

Possible cause:	Remedy:
Viscosity of oil too low.	Fill with correct oil (see chapter 1.9); ⁜ 1.
Defective crankcase venting plug.	Clean or renew the crankcase venting plug; ⁜ 1.
Piston rings worn or damaged.	Renew piston rings and cylinder; ⁜ 2.
Piston rings worn or damaged after only a short period.	Renew piston rings and cylinder; ⁜ 2. (ensure that the inlet air is clean, e.g. by using an air filter with a higher grade of filtration).

9 Maintenance

9.1 Observe the following during all maintenance and servicing.

Disregarding these notes and/or improper handling may result in serious injury.

Work on power--driven equipment may only be carried out or supervised by persons trained in that particular equipment or by a specialist.

Work on electrical equipment in the machine may only be carried out according to electrical engineering regulations by a qualified electrician, or trained personnel under the supervision of a qualified electrician.

Before starting any maintenance work switch off at the main switch and lock off to secure against unwanted or accidental switching on.

Make sure the machine is shut--off or isolated from the air main during maintenance work to ensure that no compressed air flows back from the main.

Before switching on again ensure that all maintenance personnel are clear of the machine, that all panels are replaced and all access doors closed.

The following points must be observed when handling lubricating and cooling materials:

Avoid contact with skin and eyes.
Do not inhale vapours and oil mist.
Do not eat or drink when handling such materials.
Fire, open flame and smoking are strictly forbidden.

Ensure that all lubricants, consumable materials and replacement parts accumulating during operation and servicing of the compressor package are disposed of according to environmental regulations.

9.2 Regular Maintenance Work

Interval	Maintenance tasks	see chapter
Daily	Check the crankcase oil level.	9.3
	Drain condensate from the air receiver.	9.4
50 h after initial start–up	Check all electrical terminals and tighten if necessary.	7.1
	Change the compressor oil	9.5
Every 500 h At least once a year	Check and clean the air filter *	9.6
	Check and clean the check valve *	9.7
	Check the pressure relief valve	9.8
Every 1000 h at least every 2 years	Change the compressor oil *	9.5
Every 3,000 h	Check correct function of the cylinder head and valves	9.11
Every 10,000 h	Change the motor bearings	9.9
	Carry out a general compressor overhaul	9.11

* Maintenance interval may change depending on model, installation, motor starting frequency and ambient conditions.

It is recommended that a log is kept of maintenance work done.

See chapter 9.13 for a sample list of maintenance tasks.

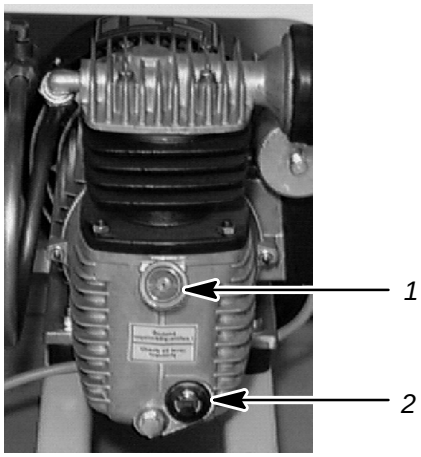
9.3 Checking the Oil Level and Topping Up (Compressor Block)

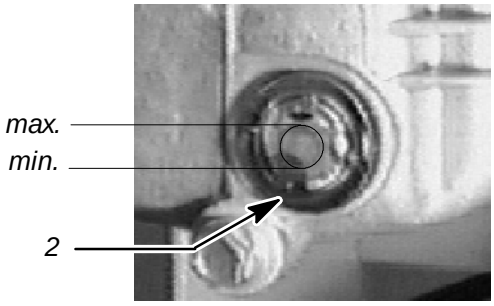
Check the oil level at the oil level sight glass daily and before each start.

Attention! **If the oil level has sunk to the lower mark, top up the oil immediately according to the oil recommendations (see chapter 1.9).**

Never top up to a level exceeding the maximum oil mark on the oil level sight glass.

Attention! **When topping up the oil always use a strainer or pour the oil directly from the new oil can.**





1 Oil filler with crankcase venting plug
2 Oil level sight glass

☞ Shut down the compressor (see chapter 8.1).

⚠ **Break the power supply by operating and locking out the main isolating device (main switch or mains plug) to prevent an accidental compressor start.**

☞ Remove the crankcase venting plug (1) from the oil filler.

Attention! **As the oil must flow through the crankcase first, the maximum oil level is reached after a few minutes have elapsed.**

☞ Fill with oil until the maximum oil level mark is reached. See chapter 1.3 for the quantity of oil required for topping up from the minimum mark to the maximum mark.

☞ Replace the crankcase venting plug in the oil filler.

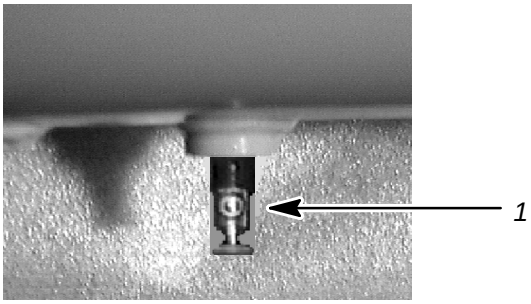
9.4 Air Receiver

Attention! **The provisions of the Pressure Vessels Act must be conformed with.**

The relevant regulations of the country concerned must also be observed.

Drain the condensate collecting in the air receiver daily with the condensate drain valve (1).

Drain the condensate into a suitable container and dispose of according to environmental care regulations!



1 Condensate drain cock

9.5 Oil Change (Compressor Block)

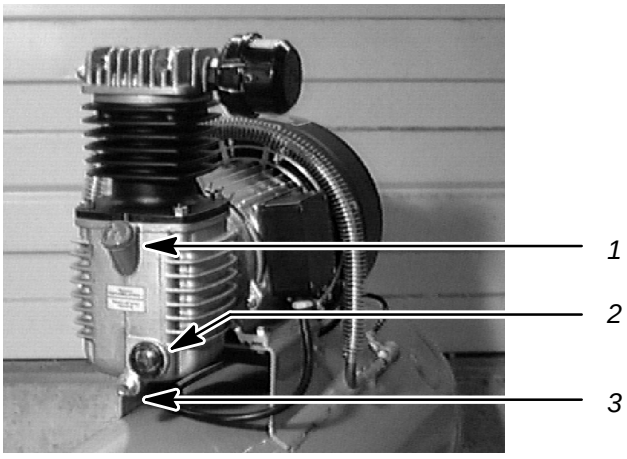
Change the oil with the compressor unit at normal operating temperature.

Danger of scalding by hot oil
Danger of burns from hot components

Change the oil after approximately the first 50 service hours.

Change the oil futher: see chapter 9.2.

If, under unsuitable operational conditions condensed water is observed in the oil, recognisable by the milky colour in the oil level sight gauge (2), carry out an oil change immediately.



1 Oil filler
2 Oil level sight glass
3 Oil drain plug

☞ Shut down the compressor (see chapter 8.1).

Break the power supply by operating and locking out the main isolating device (main switch or mains plug) to prevent an accidental compressor start.

☞ Remove the crankcase venting plug (1) from the oil filler.

☞ Prepare a container to catch the oil.

Collect the used oil and dispose of according to environmental care regulations!

☞ Unscrew the oil drain plug (3) and drain the oil into the container.

☞ Flush out the crankcase with a small quantity of new oil.

☞ Screw the oil drain plug back into the crankcase.

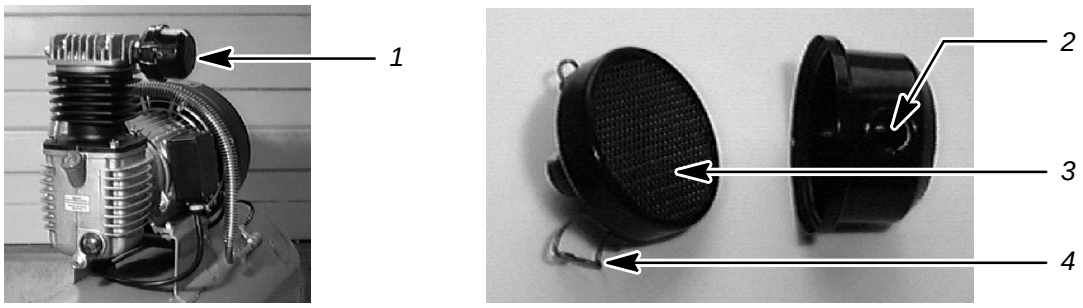
Attention! **When topping up the oil always use a strainer or pour the oil directly from the new oil can.**

☞ Fill up with new oil (see chapter 9.3).

9.6 Clean or Renew the Air Filter

The filter cartridge (3) of the air filter (1) consists of oil wetted knitted coconut fibre.

Clean the filter cartridge (3) at the latest after 500 service hours. If the cartridge is heavily contaminated or has been cleaned often, renew the air filter complete.



1 Air filter
2 Air inlet
3 Filter cartridge
4 Spring clips

☞ Shut down the compressor (see chapter 8.1).

Break the power supply by operating and locking out the main isolating device (main switch or mains plug) to prevent an accidental compressor start.

☞ Unscrew the air filter (1) from the cylinder head.

☞ Unhook the spring clips (4) and open the filter cap.

Attention! **Clean the filter with diesel fuel in the open air. Observe the regulations concerning the handling of combustible fluids.**

☞ Clean the filter cap, especially the sealing surfaces.

☞ Wash out the filter cartridge (3) with diesel fuel or clean with a steam jet.

☞ When the filter cartridge (3) is dry wet lightly with oil.

Attention! **When screwing on the air filter take care that the air inlet in the filter cap (2) is facing downwards.**

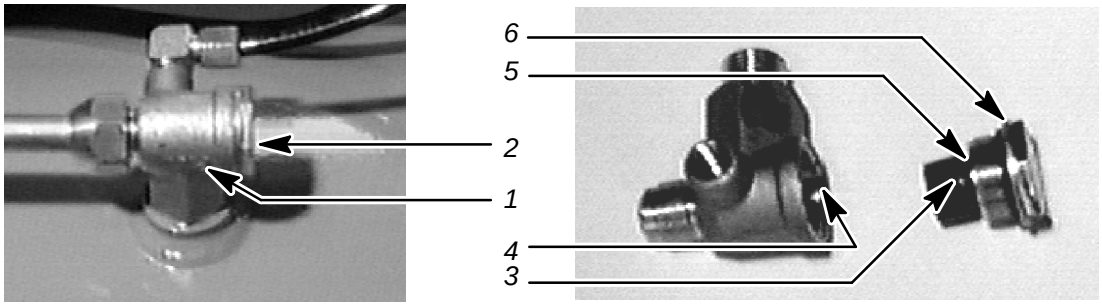
☞ Screw on the air filter (1), fit the cap.

Attention! **If the cartridge is heavily contaminated or has been cleaned often, renew the air filter complete.**

9.7 Clean or Renew the Nonreturn Valve

The nonreturn valve is fitted to the inlet port of the compressed air line on the air receiver. It prevents the compressed air flowing back from the air receiver into the compressor block.

Check and, if necessary, clean the nonreturn valve every 500 service hours.



1 Nonreturn valve
2 End plug
3 Valve cone
4 Valve seat
5 Spring
6 Sealing ring

☞ Shut down the compressor (see chapter 8.1).

Break the power supply by operating and locking out the main isolating device (main switch or mains plug) to prevent an accidental compressor start.

☞ Isolate the compressor unit from the air main (close the user's shut–off valve).

☞ Vent the air receiver with the condensate drain cock (see chapter 9.4).

Do not open the end plug in the valve housing until the pressure gauge indicates zero.

☞ Unscrew the end plug (2) in the valve housing.

☞ Clean the valve cone (3) and valve seat (4).

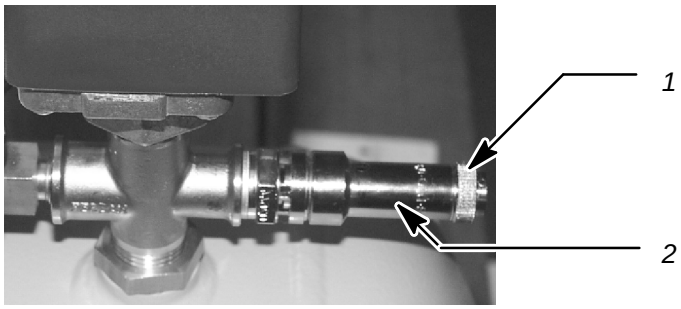
☞ Renew the valve cone (3), the spring (5) and the sealing ring (6) if they are heavily worn or damaged.

☞ Reassemble in the reverse order.

9.8 Checking the Safety Valve

If the maximum permissible gauge working pressure in the air receiver is exceeded, the safety valve (2) opens and blows off the excess air to protect the compressor unit and the consumers connected to the air mains.

To prevent the valve seat from sticking, open the safety valve every 500 service hours or at least annually.



1 Knurled ring
2 Safety valve

Attention! **It is essential to wear ear protection when testing the pressure relief valve because of the loud noise produced by escaping air.**

☞ Switch the compressor off (see chapter 8.1).

Isolate from the power supply by means of the main switch or by withdrawing the mains plug and lock out the switch to prevent an inadvertent start.

☞ Turn the knurled screw on the pressure relief valve anticlockwise until air escapes and then turn back again.

Attention! **A defective pressure relief valve must be renewed completely.**

Attention! **Tampering with the pressure relief valve and damaging the lead seal is forbidden and will invalidate all liability.**

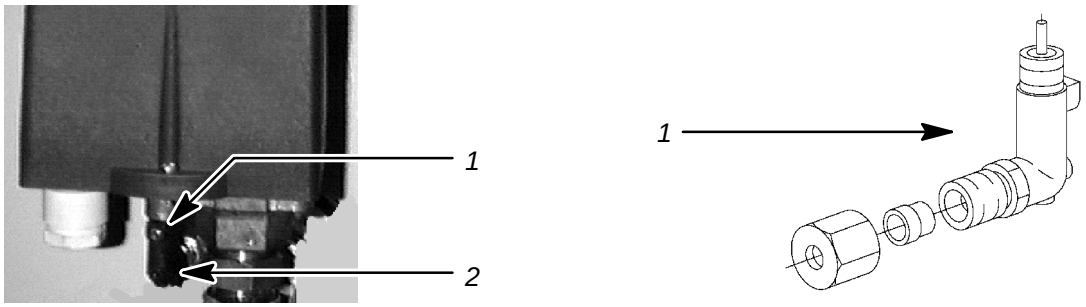
9.9 Maintenance of the Motor Bearings

- The motor bearings are permanently greased.
- Under normal operating conditions, with ambient temperatures around 25 ˚C, the motor bearings should be renewed approximately every 10 000 service hours.
- The wear on the bearings increases with higher ambient temperatures. With very high ambient temperatures of around 35 ˚C renew the bearings approximately every 6000 hours.
- Change the motor bearings every 3 years independent of service hours.

Attention! **The bearings must be changed by KAESER--Service when the above maintenance is due.**

9.10 Renewing the Unloading Valve of the Pressure Switch

If a dirty unloading valve causes the compressor unit to start with difficulty, it must be renewed.



1 Unloading valve
2 Hex socket head bolt

☞ Shut down the compressor unit (see chapter 8.1).

Break the power supply by operating and locking out the main isolating device (main switch or mains plug) to prevent an accidental compressor start.

☞ Isolate the compressor unit from the air main (close the user's shut–off valve).

☞ Vent the air receiver with the condensate drain valve (see chapter 9.4).

☞ Unscrew the hoses from the pressure switch.

☞ Unscrew the hex socket head bolt (2) and take out the unloading valve (1).

☞ Fit a new unloading valve.

☞ Start the compressor unit (see chapter 8.1).

☞ Check for leaks, e.g. brush on soapy water.

9.11 Check or Renew the Cylinder Head and Valves (Compressor Block)

Check the cylinder head and the valves for correct function after 3000 service hours.

Attention! **If faults are obvious on the cylinder head or the valves, these parts must be repaired or renewed by KAESER Service.**

Have the compressor generally overhauled by KAESER Service after 10000 service hours.

9.12 Checking Compressor Unit Performance

The effective compressor unit performance can be determined by measuring the charging time of the air receiver.

☞ Shut down the compressor unit (see chapter 8.1).

Break the power supply by operating and locking out the main isolating device (main switch or mains plug) to prevent an accidental compressor start.

☞ Isolate the compressor from the air main (close the user's shut–off valve).

☞ Vent the air receiver with the condensate drain cock and then close the cock again (see chapter 9.4).

☞ Close the shut–off valve on the air receiver.

☞ Start the compressor unit (see chapter 8.1) and simultaneously measure and compare the charging time taken to achieve the gauge pressure stated in the technical specification (see chapter 1.10).

9.13 Maintenance Record

Model: . . . . . .

Serial number: . . . . . .

Date	Description of work	Operating hours	Signature

10 Spare Parts and After Sales Service

10.1 Service Parts and Expendable Parts

Name	No. off	Part number
Air filter	1 off	6.0173.1
Nonreturn valve	1 off	8.0263.3

KAESER KOMPRESSOREN

KAESER KOMPRESSOREN GmbH
Carl – Kaeser – Str. 26, 96450 Coburg
GERMANY Telefon + 49 95 61 64 00
Fax + 49 95 61 01 30

Model .....
Part No. .....
Serial No. .....
Year of production .....
Max. working press. (g) ..... **bar**
Free air delivered ..... **l/min .. (... bar)**
Rated voltage .....
Rated motor speed ..... **rpm**
Rated power ..... **kW**
Ambient temperature ..... **°C /** ..... **°C**

10.2 Ordering Spare Parts

When ordering spare parts always state (see nameplate):

– Compressor model
– Year of manufacture
– Part number
– Serial number

Important for all queries:

☞ Enter the data from the nameplate of the compressor unit in the nameplate illustrated above.

Always quote the data on the nameplate when ordering spare parts or making enquiries.

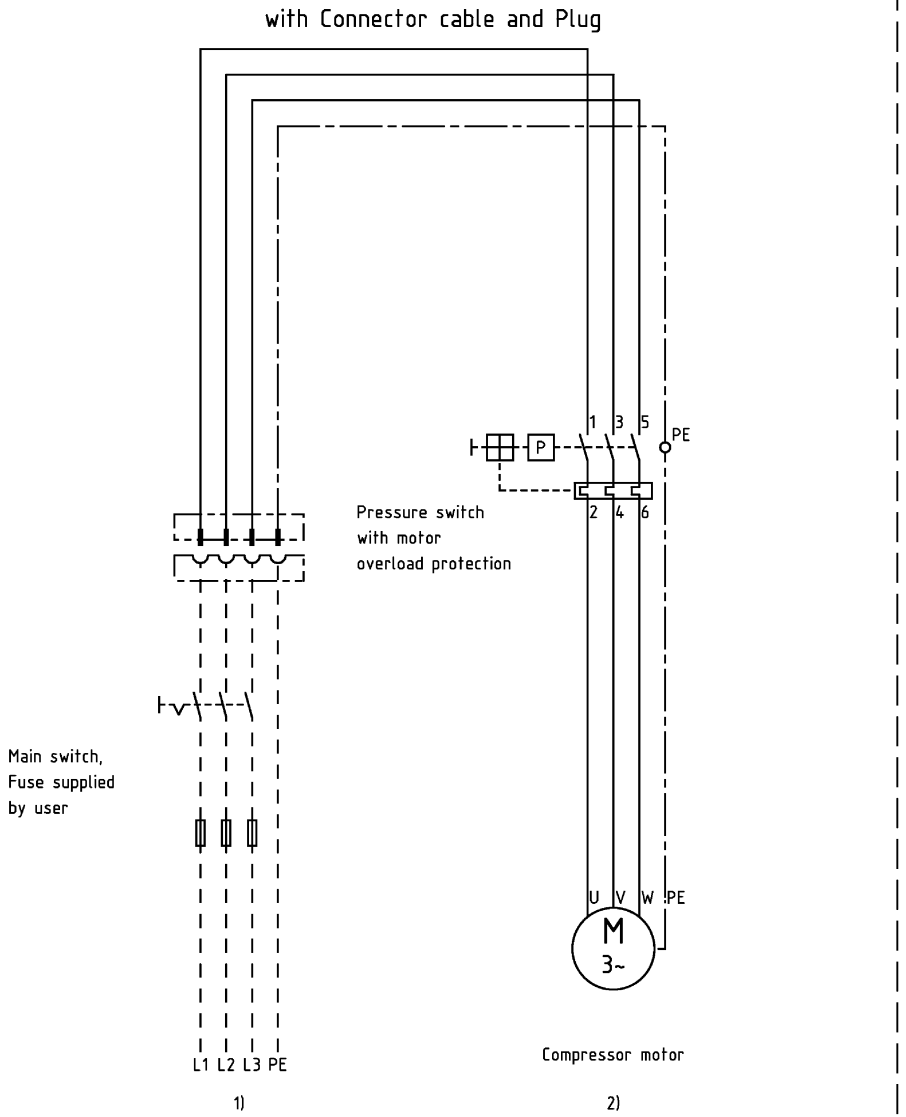
Attention! **Do not fit inferior consumable or spare parts. Use only original parts supplied by the compressor manufacturer.**

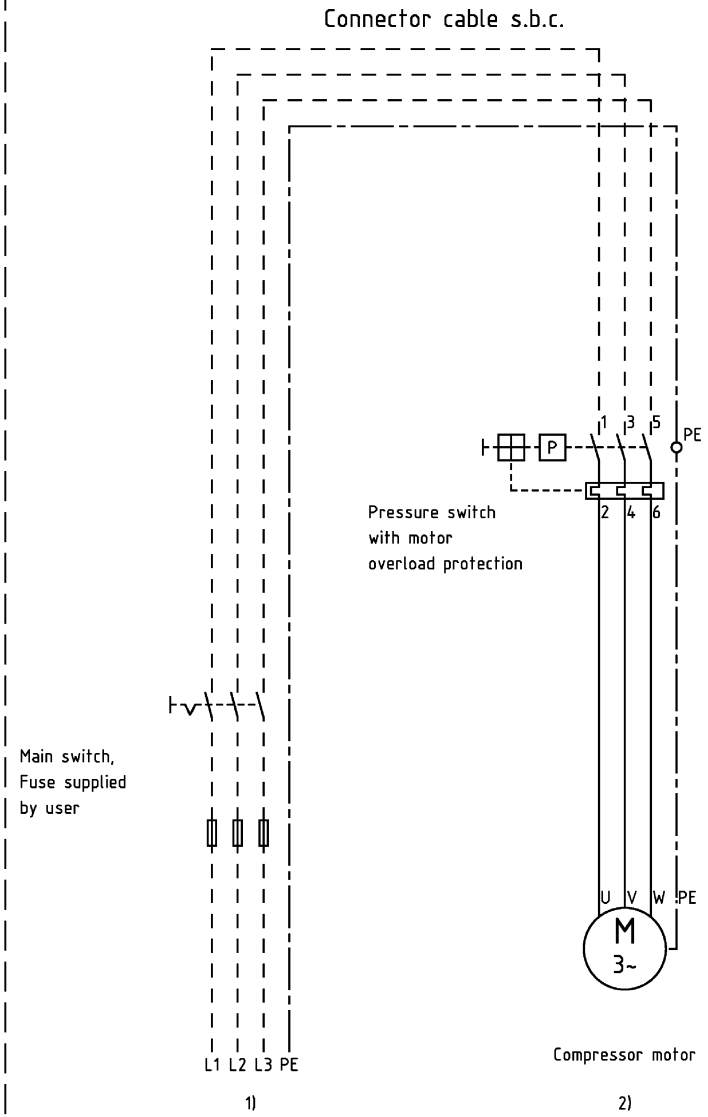
We must point out that maintenance parts, spare parts and accessories not delivered by KAESER are also not tested and cleared by us. The fitting and/or use of such products can, under certain circumstances, change the design characteristics of the compressor unit negatively and therefore affect the active and/or passive safety of the unit.
The use of such parts or accessories exempts KAESER from all liabilities and warranties for consequential damage caused by such parts or accessories.

11 Appendix

11.1 Electrical Diagram

(see following page)





1) See service manual, Technical specification: Electrical connection
2) See service manual, Technical specification: Drive motor

c				Datum	12.04.1996 E		KAESER KOMPRESSOREN	Circuit diagram Reciprocating compressor-unit Three-phase	=
b				Bearb.	Reuß				+
a				Gepr.					
D	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung:	SKK.D-0496/00400 Blatt 1 Bl.